Single Aisle
TECHNICAL TRAINING MANUAL
T1+T2 (IAE V2500) (Lvl 2&3)
RECORDING SYSTEMS

This document must be used for training purposes only

Under no circumstances should this document be used as a reference

It will not be updated.

All rights reserved
No part of this manual may be reproduced in any form,
by photostat, microfilm, retrieval system, or any other means,
without the prior written permission of AIRBUS S.A.

AIRBUS Environmental Recommendation
Please consider your environmental responsability before printing this document.

RECORDING SYSTEMS

Recording System Component Location (2) 2
Recording System Control & Indicating (2) 8

UP & DOWN DATA LOADING SYSTEM

Up & Down Data Loading System Presentation (2) 10

DIGITAL FLIGHT DATA RECORDING SYSTEM (DFDRS)

DFDRS Description/Operation (3) 14
FDIMU Interfaces (3) 16

A/C INTEGRATED DATA SYSTEM (AIDS-SFIM)

Print Report STD Header Description (3) 18
Individual Print Report Description (3) 24
AIDS Programming (3) 52

A/C INTEGRATED DATA SYS (AIDS-TELEDYNE) (option)

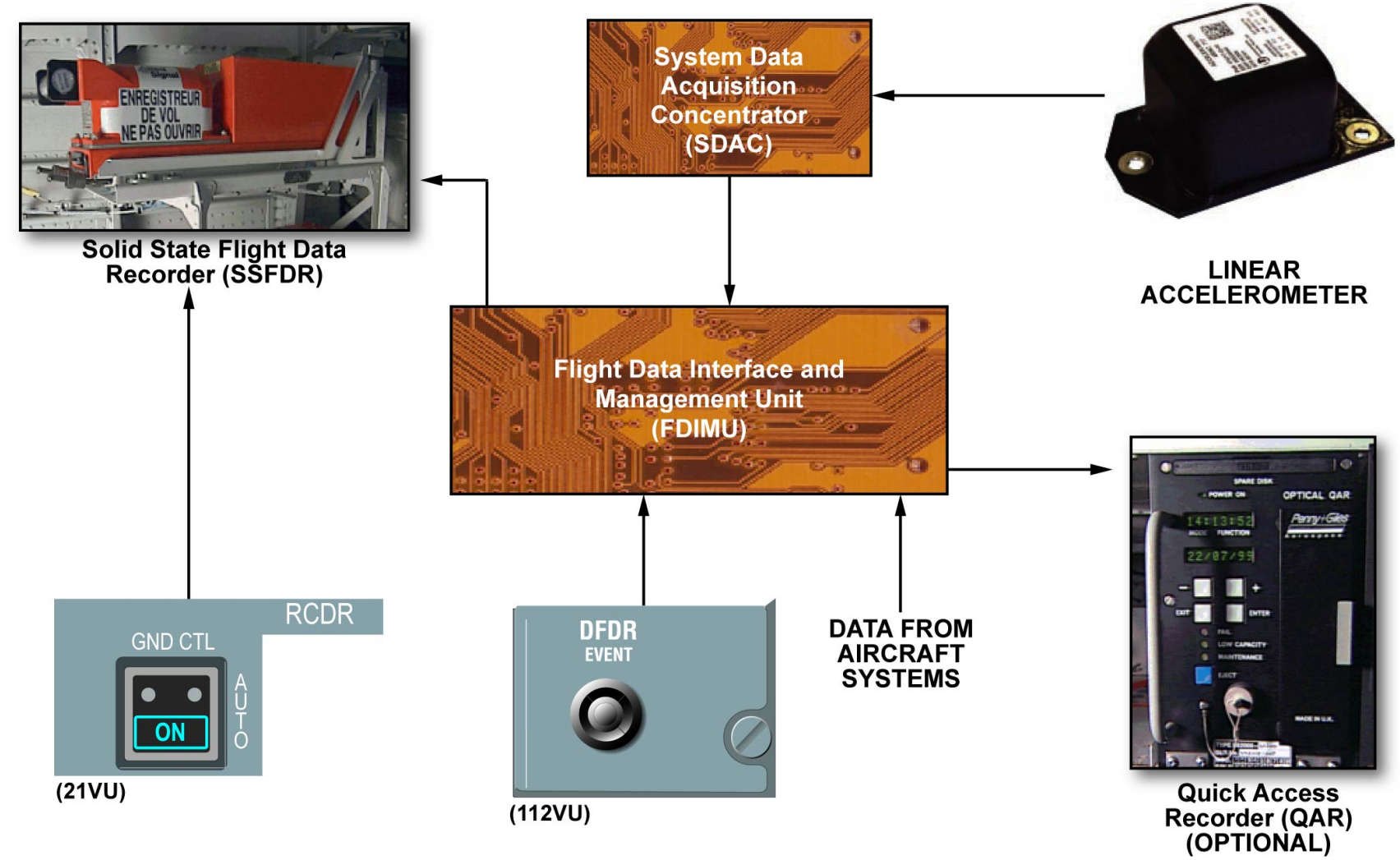
Print Report STD Header Description (3) 58
Individual Print Report Description (3) 64
AIDS Description/Operation (3) 94

RECORDING SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW

The Flight Data Interface and Management Unit (FDIMU) has two primary functions. The first is the Flight Data Interface Unit (FDIU) function.
To obey the mandatory requirements of crash recording, the FDIU acquires and formats several important flight parameters and system data before it supplies them to the Solid State Flight Data Recorder (SSFDR).
The linear accelerometer measures the acceleration of the A/C in all three axes. The System Data Acquisition Concentrator (SDAC) digitizes the analog signal of the linear accelerometer and sends it to the FDIU.
For maintenance and performance purposes, the optional Quick Access Recorder (QAR) records the same parameters as the SSFDR. The operation of the SSFDR is automatic.
On the overhead panel, there is a GrouND ConTroL P/B, which is on the ReCorDeR panel. This P/B lets the SSFDR be supplied when the A/C is on ground for preflight checks before engine start or for tests and maintenance. On the center pedestal, there is a Digital Flight Data Recorder (DFDR) EVENT P/B, which can be used to set an event mark on the SSFDR memory.

UGB13131 - U7ST0M0 - UM31C3COMPLOC01



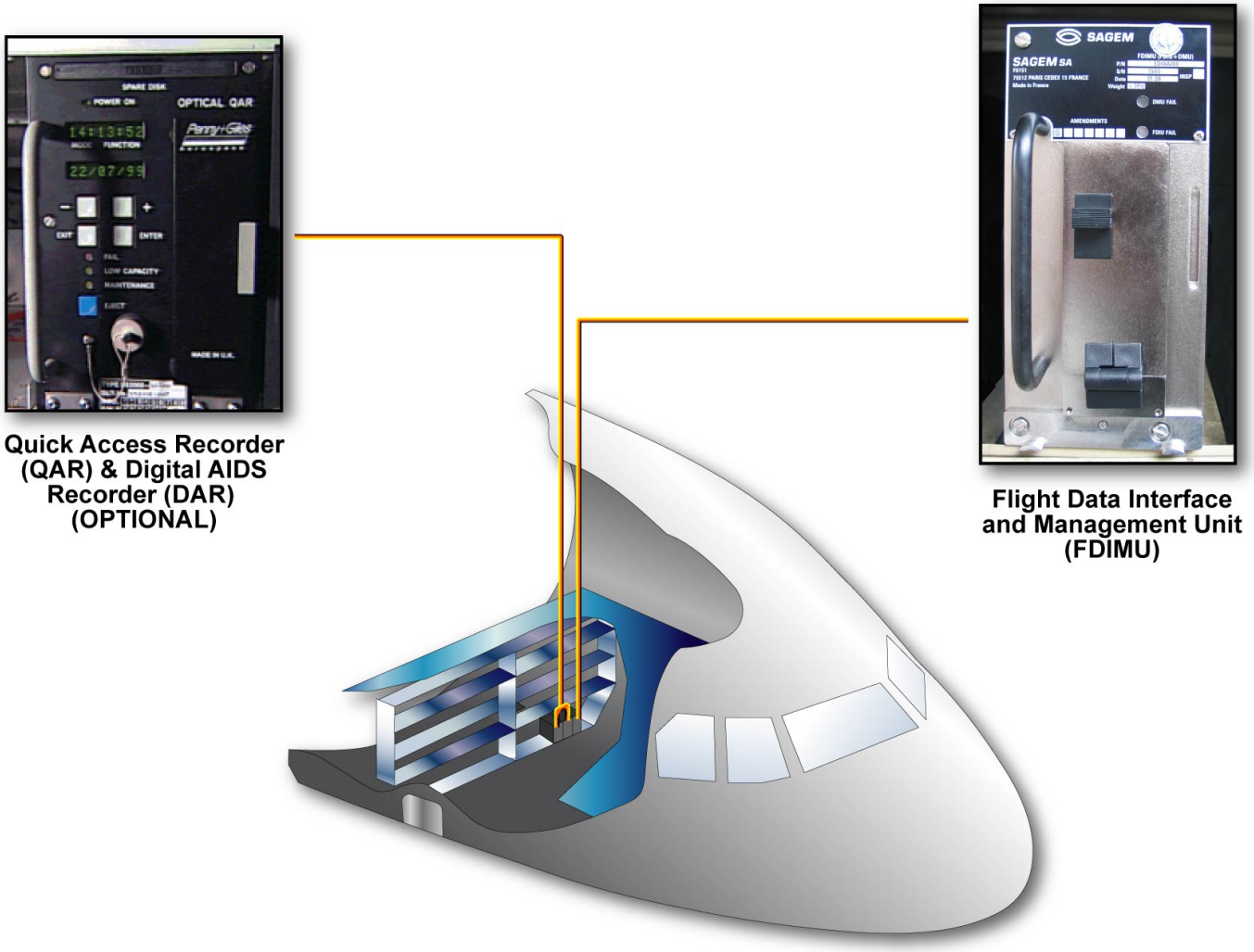
SYSTEM OVERVIEW

RECORDING SYSTEM COMPONENT LOCATION (2)

COMPONENT LOCATION

The DFDRS and AIDS computers are in the aft avionics rack.
About the QAR/DAR, there are several vendors of optical disk storage media. The recorder is then called Optical QAR/DAR (OQAR/ODAR).
There is also a version from Teledyne that includes a GSM module for data transmission called WQAR (Wireless GroundLink QAR).
The FDIMU computer is in the aft avionics rack.
The SSFDR is installed immediately above the Cockpit Voice Recorder (CVR), in an unpressurized area of the rear fuselage.
The SSFDR stores the data of the last 25 hours collected by the FDIU.
The SSFDR stores these data in a solid state memory which is in a crash-and-fire-protected housing.
The linear accelerometer is near the A/C center of gravity.
It sends the accelerations in the 3 axes (pitch, roll and yaw) to the DFDRS.

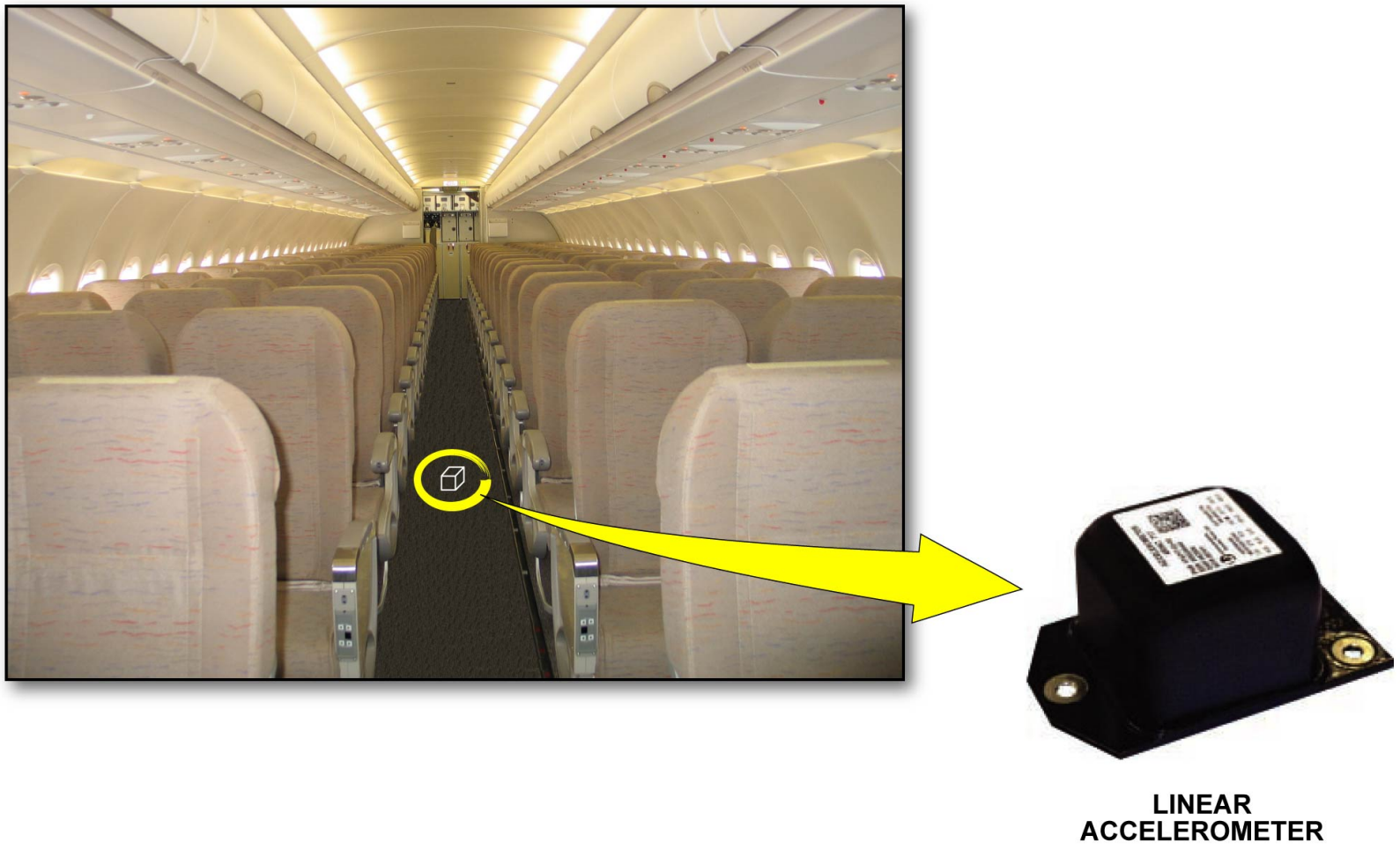
UGB13131 - U7ST0M0 - UM31C3COMPLOC01



COMPONENT LOCATION

Solid State Flight Data Recorder (SSFDR)

COMPONENT LOCATION



COMPONENT LOCATION

RECORDING SYSTEM CONTROL & INDICATING (2)

RECORDERS and AIDS

UGB13131 - U7ST0M0 - UM31IYLEVEL0202

This Page Intentionally Left Blank

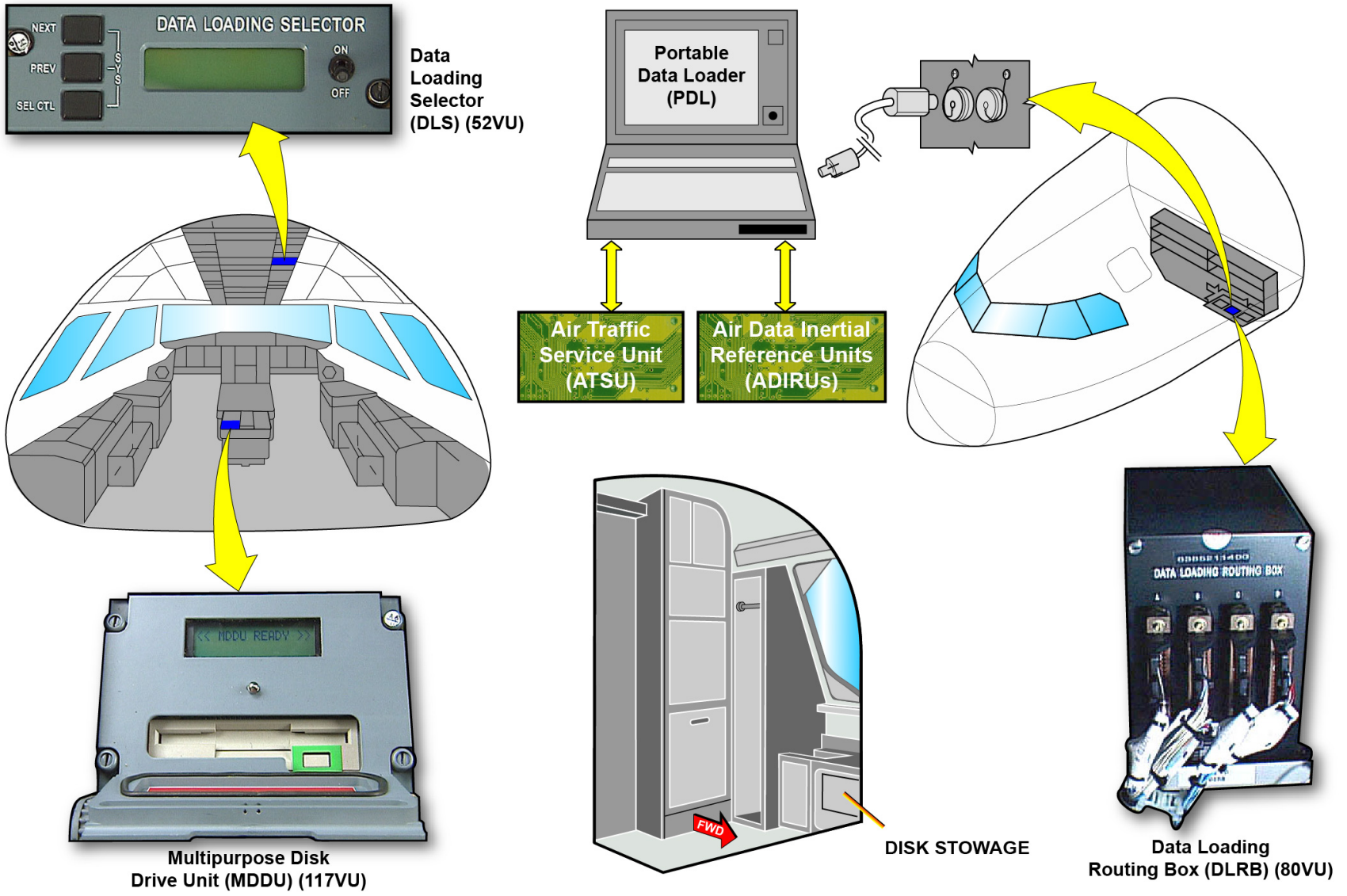
UP & DOWN DATA LOADING SYSTEM PRESENTATION (2)

GENERAL

The data loading system is an interface between the aircraft computers and ground data processing equipment used to update software (S/W) and database or to retrieve aircraft system data. The data loading system includes:
- a Data Loading Selector (DLS) to select the computer on which data will be loaded,
- a Multipurpose Disk Drive Unit (MDDU) to upload or download data,
- a stowage box with a 42 disk maximum capacity (the Disk Stowage is in the left and right sides consoles and can be locked with a key),
- a Data Loading Routing Box (DLRB) to route the input/output data between the disk unit and the target computer.

When Portable Data Loader (PDL) connectors are installed, ARINC 615A data loading of the Air Traffic Service Unit (ATSU) and Air Data Inertial Reference Units (ADIRUs) is possible.

UGB13131 - U7ST0M0 - UM31PD000000001


DATA LOADING SELECTOR
NEXT
PREV
SEL CTL
ON
OFF
Data Loading Selector (DLS) (52VU)
Portable Data Loader (PDL)
Air Traffic Service Unit (ATSU)
Air Data Inertial Reference Units (ADIRUs)
<< MDDU READY >>
Multipurpose Disk Drive Unit (MDDU) (117VU)
FWD
DISK STOWAGE
DATA LOADING ROUTING BOX
Data Loading Routing Box (DLRB) (80VU)

GENERAL

UP & DOWN DATA LOADING SYSTEM PRESENTATION (2)

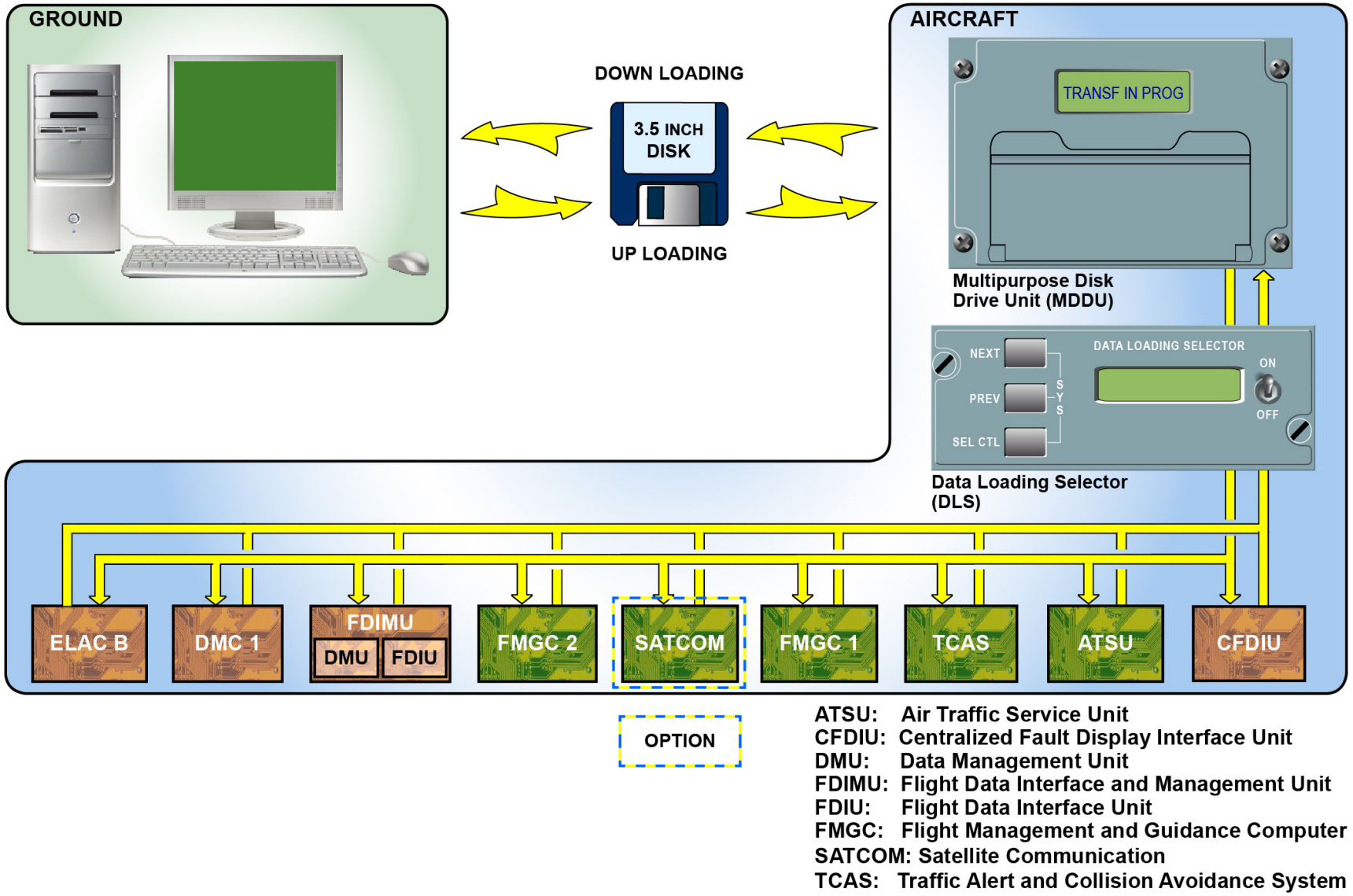
UP LOADING

The aircraft system computers use the loading system to update their data base, for example the Flight Management and Guidance Computer (FMGC) or to modify parts of their operational S/W, for example the ATSU. The Up loading is automatically done from a 3.5 inch disk, via an internal logic specific to each computer.
Power supply plug is installed to enable data loader power supply.

DOWN LOADING

The down loading system is used to down load, to a 3.5 inch disk, the data recorded by some computers during aircraft operation, for example the Data Management Unit (DMU) part of the Flight Data Interface and Management Unit (FDIMU). Down loading is done automatically through an internal logic specific to each computer.

UGB13131 - U7ST0M0 - UM31PD000000001



UP LOADING & DOWN LOADING

DFDRS DESCRIPTION/OPERATION (3)

FDIMU

The Flight Data Interface and Management Unit (FDIMU) combines two functions which operate independently from each other: the Flight Data Interface Unit (FDIU) and the Data Management Unit (DMU). An internal data-bus connects the two parts. The FDIU-part receives discrete and digital parameters and processes them. The functions of the FDIU-part are:
- conversion,
- comparison,
- check and Built-In Test Equipment (BITE).

The FDIU-part converts the input parameters into a numerical format for:
- the Digital Flight Data Recorder (DFDR),
- the optional Quick Access Recorder (QAR).
-the Digital AIDS Recorder (DAR)

The FDIU-part compares the data that it sends with the data recorded by the DFDR. The recorded data is transmitted back to the FDIU-part through the playback data bus. For PCMCIA recording function, data transmission from the FDIMU part to DMU part is given through an internal ARINC 429 data bus. The FDIU-part checks the integrity of the mandatory parameters during the flight. After the flight, engines shutdown, only the Linear Accelerometer (LA) signal check is done. The FDIU-part includes BITE and monitoring functions.

DFDR

The DFDR stores data, which the FDIU-part has collected during the last 25 hours. The data is recorded in data frames. Each frame contains data received during one second. The DFDR includes BITE functions. The DFDR status signal is sent to the Centralized Fault Display Interface Unit (CFDIU) through the FDIU-part and to the Electronic Centralized Aircraft Monitoring (ECAM) through the System Data Acquisition Concentrators (SDACs). The DFDR energization is controlled through the power interlock circuit. The underwater locator beacon installed on the front face of the DFDR gives the location of the recorder if the aircraft is immersed in water following an accident. The underwater locator beacon has a battery, which is activated by both fresh and salt water.

QAR (OPTIONAL)

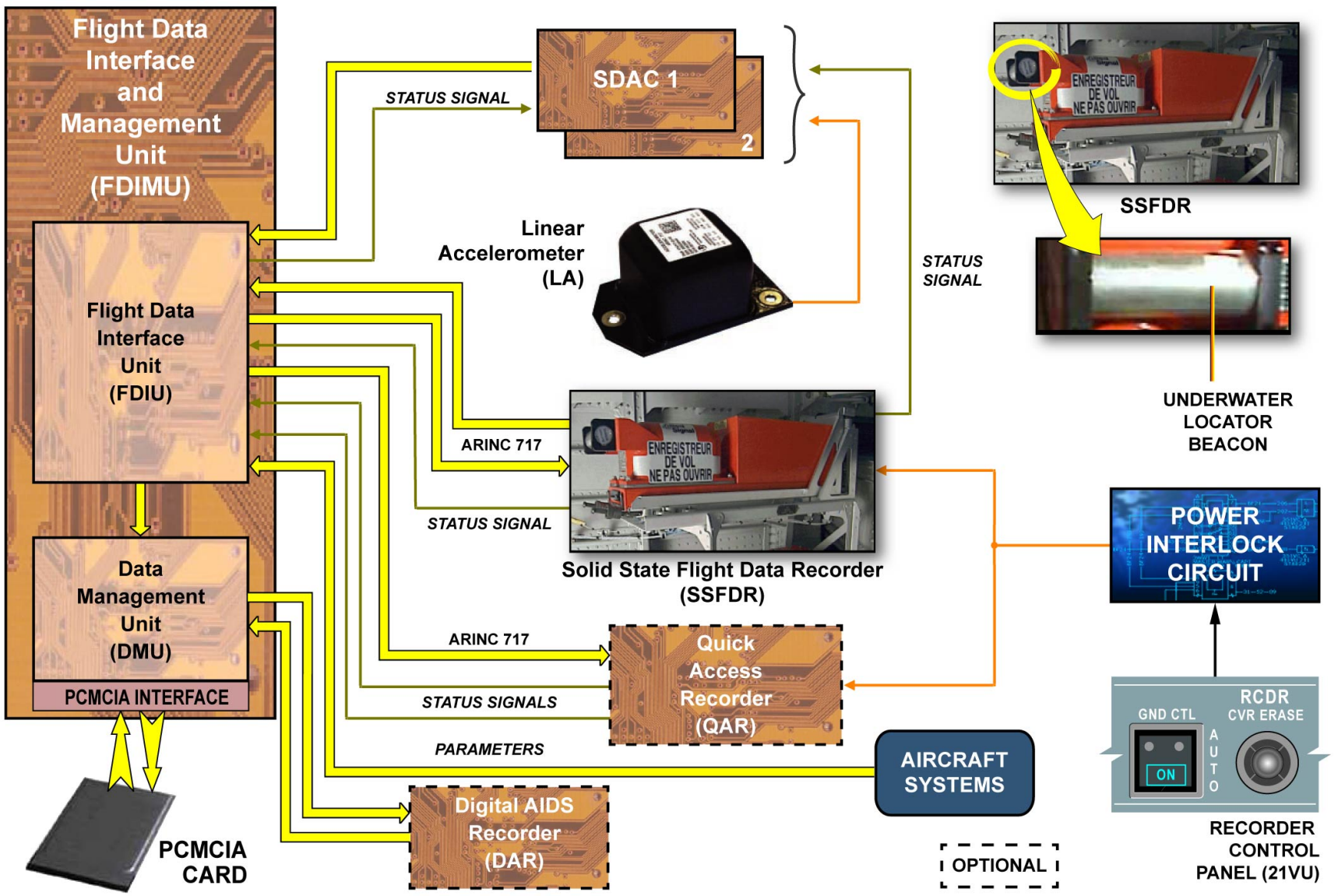
The QAR stores the same data as the DFDR for on ground performance, maintenance or condition monitoring tasks. The data frames stored in the QAR are identical to the DFDR data frames. The QAR includes BITE functions. The QAR status signals (QAR MEDIA LOW, QAR FAIL) are sent to the lamps on its front face and to the CFDIU through the FDIU-part. The QAR energization is controlled through the power interlock circuit. If installed, the DAR records data in a formatted optical disk.

LINEAR ACCELEROMETER

The task of the LA is to measure the acceleration of the aircraft in all three axes. The range of measurement is:
- vertical axis (Z): -3 to +6 g,
- longitudinal axis (X): -1 to +1 g,
- lateral axis (Y): -1 to +1 g.

The LA generates an analog signal, which is sent to the SDACs. This signal is digitalized and sent to the FDIU-part through an ARINC 429 bus.

UGB13131 - U7ST0M0 - UM31DD00000002



FDIMU ... LINEAR ACCELEROMETER

FDIMU INTERFACES (3)

ARINC 429 INPUTS

Most information is given to the Flight Data Interface and Management Unit (FDIMU) through ARINC 429 buses. The Flight Data Interface Unit (FDIU) part of the FDIMU receives 15 ARINC 429 buses 10 of which are shared with Data Management Unit (DMU) part.

NOTE: The Linear Accelerometer (LA) sends an analog signal to the System Data Acquisition Concentrators (SDACs), which digitalizes it before to send it to the FDIU-part.

ARINC 429 OUTPUTS

2 ARINC 429 output buses are supplied. The output bus to the Centralized Fault Display Interface Unit (CFDIU) is used for maintenance and test of the Digital Flight Data Recording System (DFDRS). The output bus to the Multipurpose Disk Drive Unit (MDDU) allows to load the application-software of the FDIU-part and DMU-part.

DISCRETE INPUTS

54 discrete inputs are given for aircraft identification coding. 5 other inputs are given for:
- Digital Flight Data Recorder (DFDR) status,
- event mark, Quick Access Recorder (QAR) FAIL,
- QAR MEDIA LOW information and,
- MDDU selection.

NOTE: The QAR is optional.

DISCRETE OUTPUT

1 discrete output is used by the SDACs to display the FDIU FAULT message on the Electronic Centralized Aircraft Monitoring (ECAM).

NOTE: To display the DFDR FAULT message on the ECAM, a DFDR status signal is directly sent by the DFDR to the SDACs.

ARINC 717 OUTPUT

The FDIU-part of the FDIMU sends the data to be recorded to the DFDR and the optional QAR through ARINC 717 output bus.

ARINC 717 INPUT

To verify the recorded data, the FDIU-part of the FDIMU receives the DFDR playback data through ARINC717 input bus.

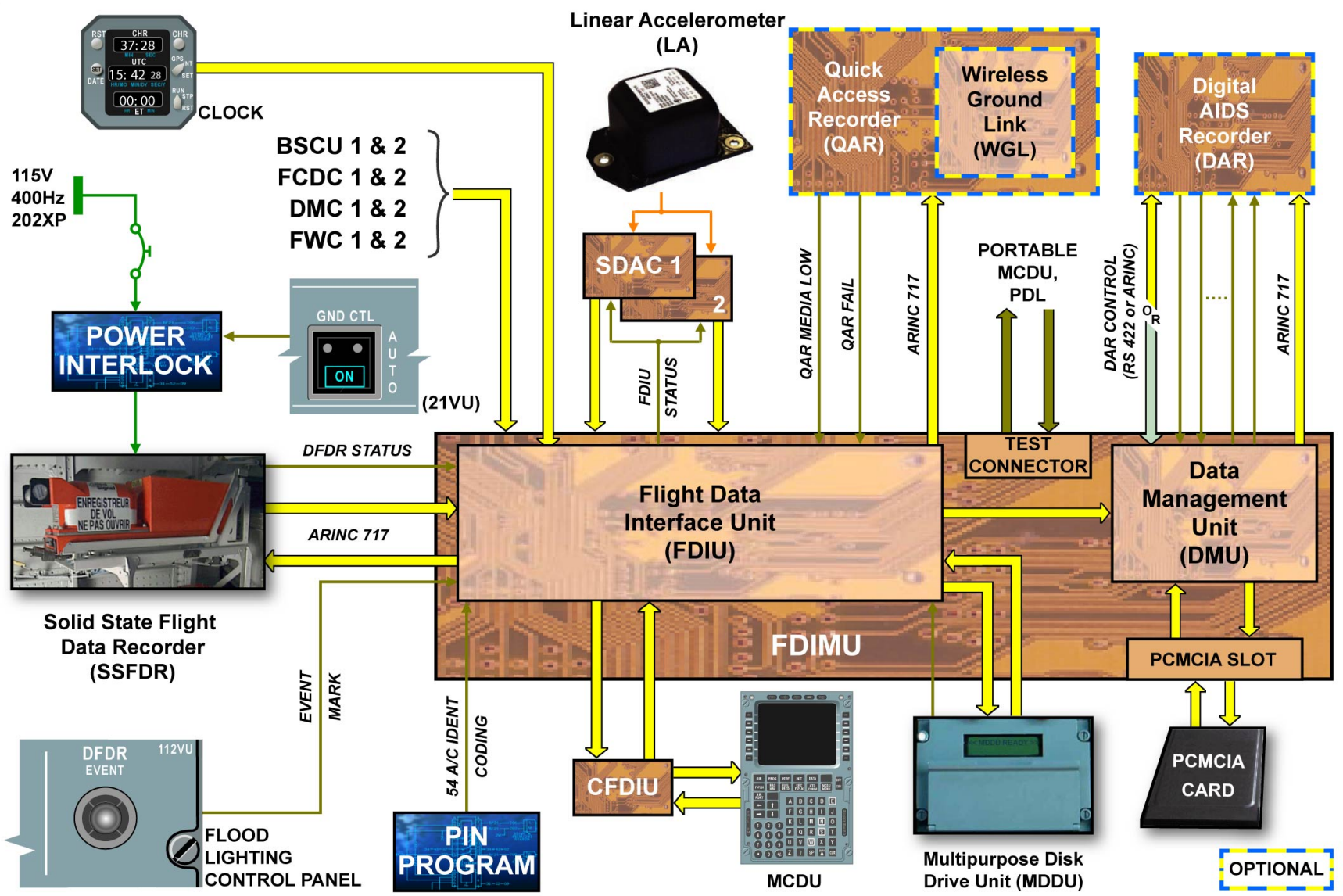
PCMCIA INTERFACE

A PCMCIA interface is integrated in the FDIMU to upload application-software and download Aircraft Integrated Data System (AIDS) reports with a notebook computer.

RS 232

To enable the connection of a portable MCDU or a Portable Data Loader (PDL), a test connector is installed on the front panel of the FDIMU. The interface for maintenance test and program is RS 232.

UGB13131 - U7ST0M0 - UM31F2000000002



ARINC 429 INPUTS ... RS 232

PRINT REPORT STD HEADER DESCRIPTION (3)

GENERAL

A standard header is printed on each report. It is composed of information about the report at the top, information about the aircraft and the flight in the middle and general data at the bottom. The header data is taken at the time when the respective report is generated.

REPORT VALUE PRESENTATION

Each data line starts with two identification letters. The presentation of the values in the data lines is according to:
- their sign: Negative values begin with "N" and, for positive values, "N" is replaced by "0" or another digit.
- their operational range without decimal point as listed in the parameter list associated to the header and each report (for these lists, refer to Aircraft Maintenance Manual (AMM) 31-37-00).
E.g.: The operational range of the Total Air Temperature (TAT) is from -60.0 to 99.9 °C. Therefore, -32.0 °C is printed out N320 and +26.5 °C is printed out 0265. In addition, a parameter, which is invalid or not updated, is replaced with "_" or "X" characters.

NOTE: In this document, as well as in the AMM, generic symbols for the value fields are used:
- "1" = 0 or 1,
- "A" = Any character in the range from A. to.Z,
- "9" = Any digit in the range from 0.to.9,
- "X" = Any character or digit in the range from A.to.Z or 0.to.9.
E.g.: TAT value is symbolized by "X999".

REPORT INFORMATION

3 free programmable lines are available for airline specific messages. Another line contains the report name and number.

AIRCRAFT AND FLIGHT INFORMATION

Line CC contains the following data:
- A/C ID: Aircraft identification (tail number),
- DATE (month/day),
- UTC: Universal Time Coordinated (hours/minutes/seconds),
- FROM TO: City pair identification,
- FLT: Flight number. The flight number is defined by up to 8 characters but only the last 4 numbers are used. Only numbers are possible and the not used positions are filled with zeros. E.g. Flight Management and Guidance Computer (FMGC) flight number AI067 is printed out 0067.

GENERAL DATA

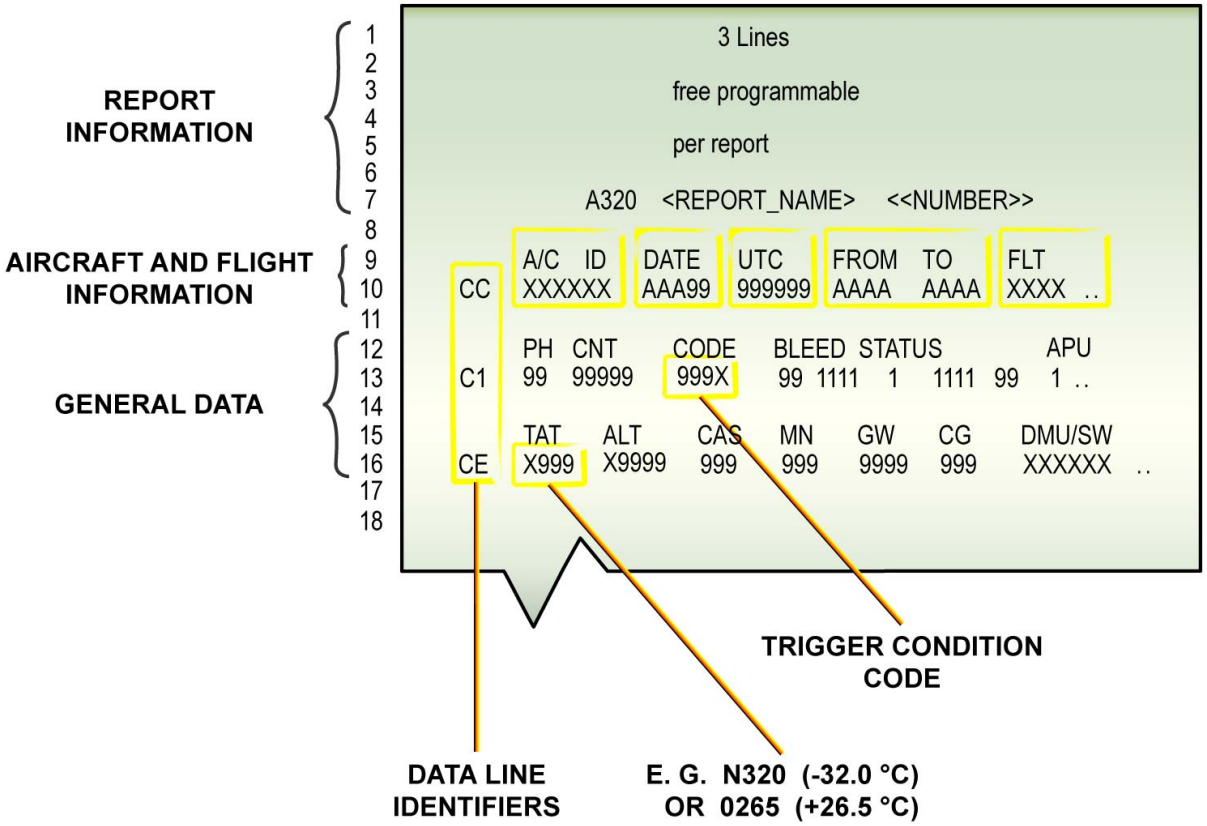
Lines C1 and CE contain the following data:
- PH: Data Management Unit (DMU) flight phase, based on flight phase from Flight Warning Computer (FWC),
- CNT: Counter of the reports previously generated (first 3 digits) and previous report number (last 2 digits),
- CODE: Trigger condition code,
- BLEED STATUS,
- APU: APU bleed valve state,
- TAT: Total Air Temperature,
- ALT: Standard altitude,
- CAS: Computed air speed,
- MN: Mach number,
- GW: Gross Weight,
- CG: Center of Gravity,
- DMU/SW: DMU software (S/W) Part Number (PN).

TRIGGER CONDITION CODE

To identify the trigger condition that caused the generation of a report, a numerical code is given:
- 1000: Manual selection via MCDU,

- 2000: Flight phase dependent manual selection via Aircraft Integrated Data System (AIDS) PRINT P/B when programmed by the airline,
- 3000: Start logic programmed by the airline,
- 4000 to 7000: Report triggered by a combination of logic conditions (refer to AMM 31-37-00 for the detailed trigger logics associated to each report),
- 8100 and 8200: Air Traffic Service Unit (ATSU) uplink request.

UGB13131 - U7ST0M0 - UM31DE000000001



GENERAL ... GENERAL DATA

This Page Intentionally Left Blank

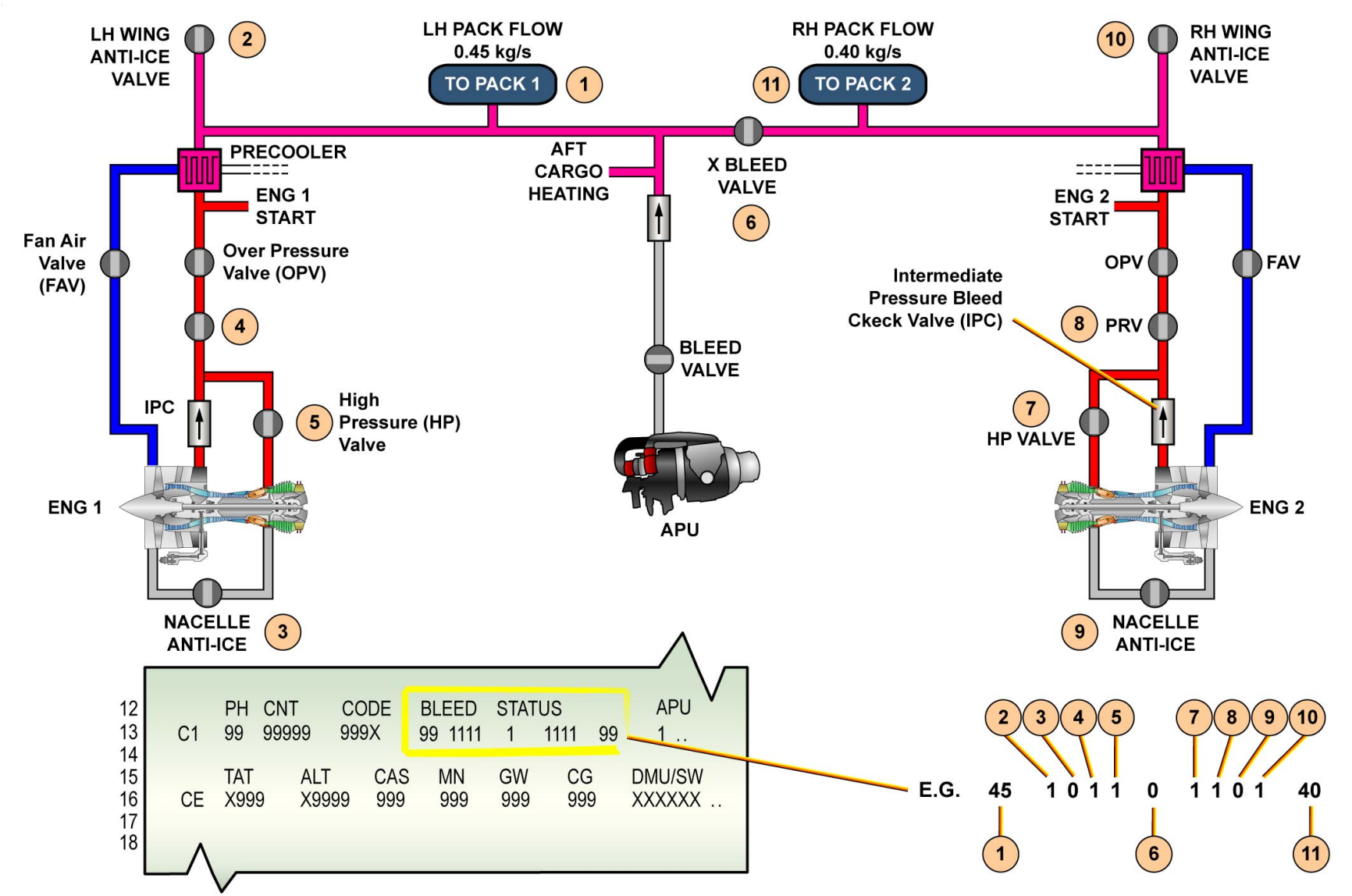
PRINT REPORT STD HEADER DESCRIPTION (3)

GENERAL DATA (continued)

BLEED STATUS

Bleed status is indicated with discrete coded information and numerical values. In the discrete coded information, 0 indicates that the valve is closed and 1 indicates that the valve is open.

UGB13131 - U7ST0M0 - UM31DE000000001



GENERAL DATA - BLEED STATUS

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

GENERAL

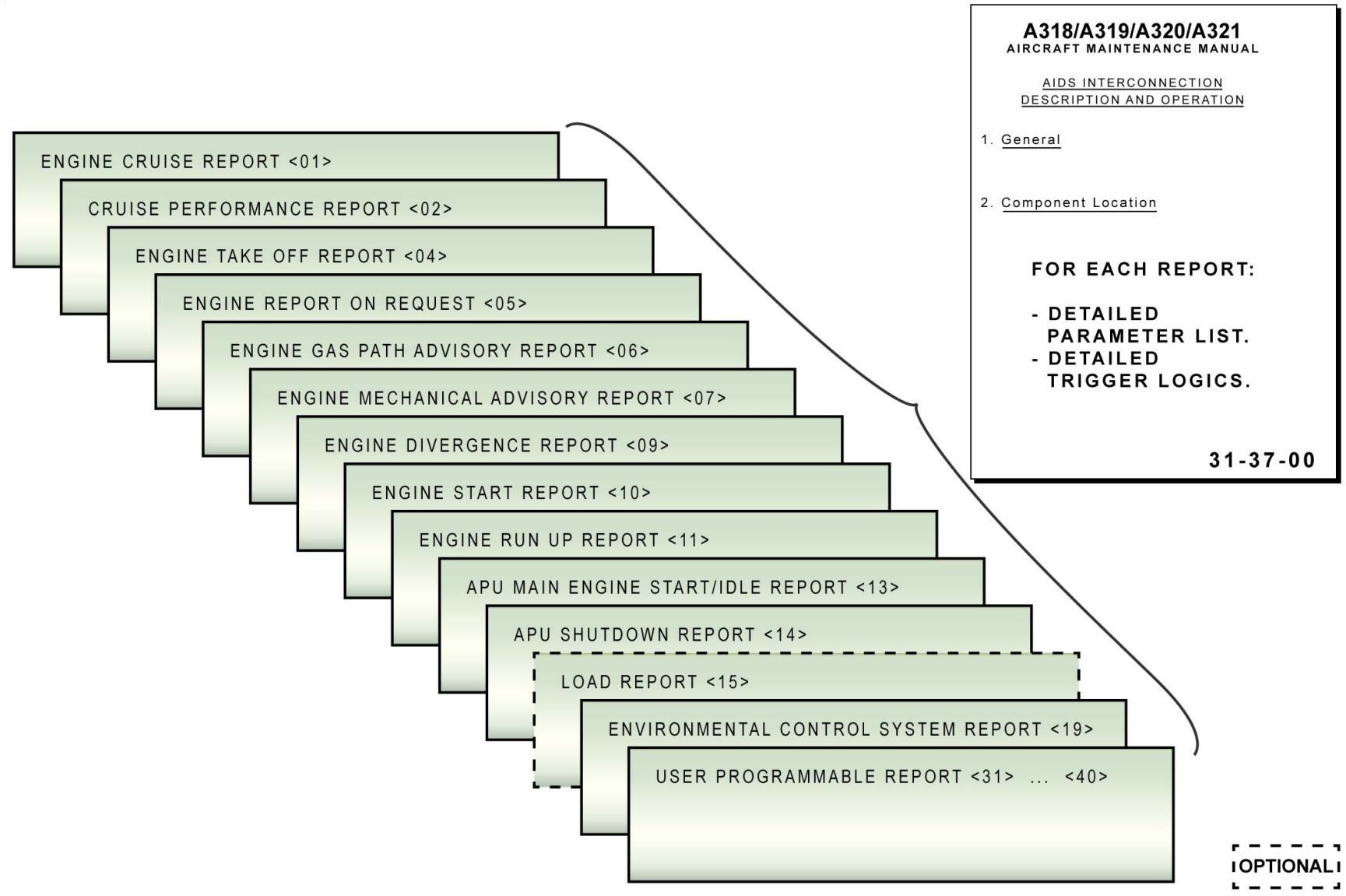
A report is a comprehensive set of data related to a specific event (e.g. limit exceedance of engine parameters). The parameters contained in the reports are among the parameters provided with an alpha call-up (refer to Aircraft Maintenance Manual (AMM) 31-37-00 for the detailed parameter list associated to each report). The Data Management Unit (DMU) processes up to 23 different types of report:
- 13 standard reports for basic aircraft, engine and APU monitoring. These reports have fixed trigger mechanism, fixed data collection and fixed output formatting. Nevertheless, certain constants and limits within fixed trigger logics are reprogrammable. Specific trigger conditions can be created for each report by means of the Ground Support Equipment (GSE).
- up to 10 additional reports, numbered from 31 to 40, for airline specific investigation and trouble shooting. These reports are user programmable with the GSE for trigger conditions, data collection, report format and output destination.

In addition to the automatic trigger logics, all the reports can be manually generated:
- via MCDU,
- via Aircraft Integrated Data System (AIDS) PRINT P/B (according to flight phase associations, if programmed),
- via Air Traffic Service Unit (ATSU) (uplink request). Refer to AMM 31-37-00 for the detailed trigger logics associated to each report.

A non-volatile memory for storage of at least 10 reports per different type of report is provided within the DMU.

NOTE: S:
- in this module, reports <01> to <11> are given for a CFM engine. They may be slightly different to your aircraft configuration.
- depending on the DMU, which is fitted on your aircraft, the LOAD REPORT <15> may not be applicable.

UGB13131 - U7ST0M0 - UM31DF000000001



GENERAL

UGB13131 - U7ST0M0 - UM31DF000000001

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE CRUISE REPORT <01>

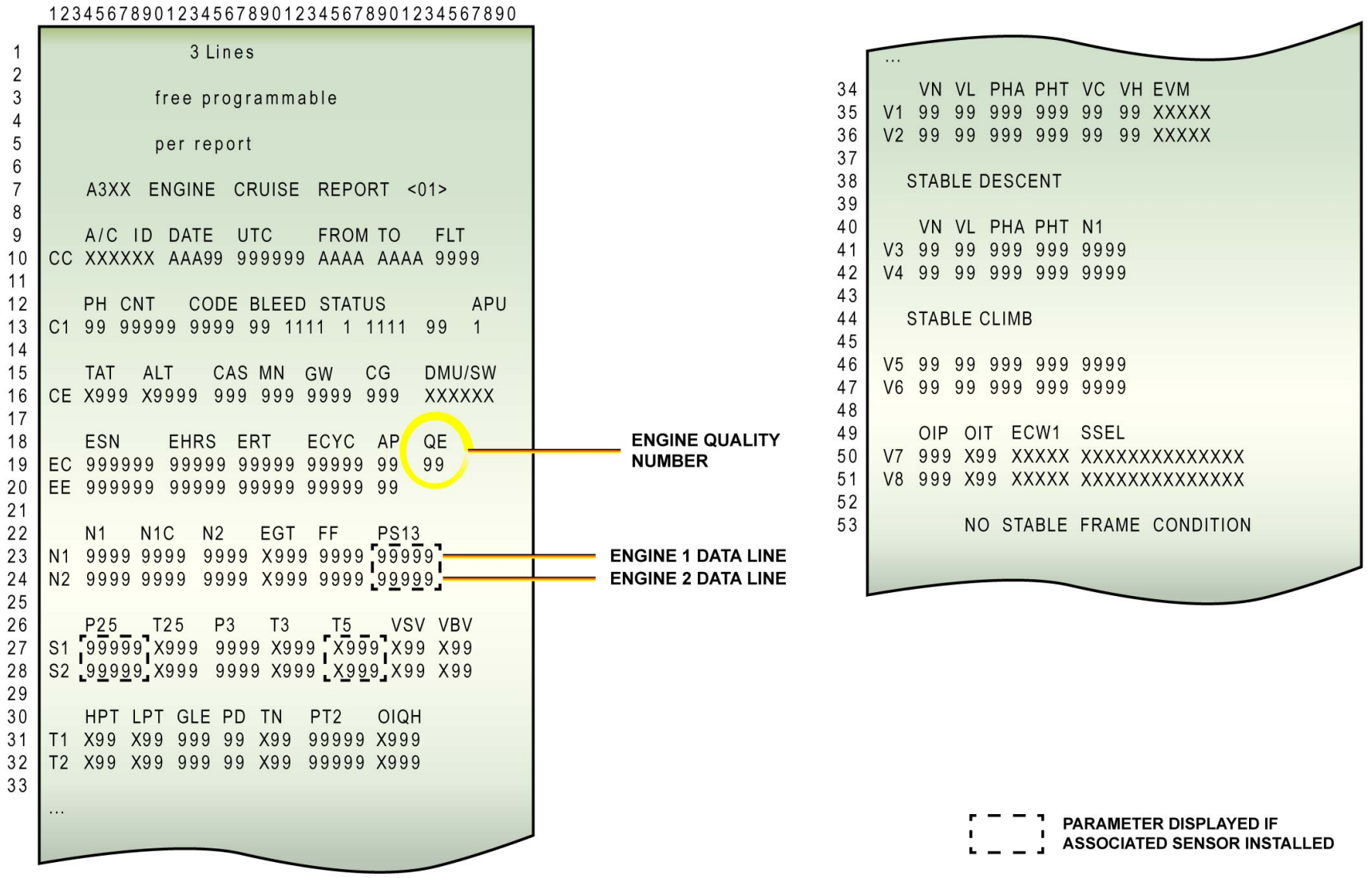
This report is a collection of data over a period of time in which the aircraft met the appropriate stability criteria. The required stability period is 100 seconds (programmable value). Basically, whatever the number of times the stability is detected, only one report is generated per flight leg. This report contains the data with the best engine quality number (QE) over the whole flight leg. If no stability is detected, then a report is generated with the following message in its last line: "NO STABLE FRAME CONDITION".

NOTE: In case of ENGINE DIVERGENCE REPORT <09> generated, an engine cruise report is also generated when the first stability is detected, regardless of quality.

The report mainly contains operating data of both engines, including vibration data. The report data are averages over the required stability period, except:
- ESN, EHRS, ERT, ECYC: Engine general data (serial number, flight hours, running time, cycle),
- AP: Autopilot status,
- QE: Engine quality number used as stability indicator for this report (00: best stability, 99: worst stability),
- OIQH: Oil consumption from the previous flight,
- EVM, ECW1, SSEL: Engine vibration status word, engine control word, and status of Full Authority Digital Engine Control (FADEC) sensors,
- data lines V3, V4: Averaged values taken from the last stable descent (i.e. descent of the last leg),
- data lines V5, V6: Averaged values taken from the last stable climb (i.e. climb of the current leg).

NOTE: For engine health monitoring purposes, 3 additional sensors can be optionally connected to the FADEC to permit recording of the following parameters: PS13 (fan tip discharge pressure), P25 (High Pressure (HP) compressor inlet pressure), T5 (Low Pressure (LP) turbine discharge temperature).

UGB13131 - U7ST0M0 - UM31DF000000001


1234567890123456789012345678901234567890
3 Lines
free programmable
per report
A3XX ENGINE CRUISE REPORT <01>
A/C ID DATE UTC FROM TO FLT
CC XXXXXX AAA99 999999 AAAA AAAA 9999
PH CNT CODE BLEED STATUS APU
C1 99 99999 9999 99 1111 1 1111 99 1
TAT ALT CAS MN GW CG DMU/SW
CE X999 X9999 999 999 9999 999 XXXXXX
ESN EHRS ERT ECYC AP QE
EC 999999 99999 99999 99999 99 99
EE 999999 99999 99999 99999 99
N1 N1C N2 EGT FF PS13
N1 9999 9999 9999 X999 9999 99999
N2 9999 9999 9999 X999 9999 99999
P25 T25 P3 T3 T5 VSV VBV
S1 99999 X999 9999 X999 X999 X99 X99
S2 99999 X999 9999 X999 X999 X99 X99
HPT LPT GLE PD TN PT2 OIQH
T1 X99 X99 999 99 X99 99999 X999
T2 X99 X99 999 99 X99 99999 X999
...
ENGINE QUALITY NUMBER
ENGINE 1 DATA LINE
ENGINE 2 DATA LINE
...
VN VL PHA PHT VC VH EVM
V1 99 99 999 999 99 99 XXXXX
V2 99 99 999 999 99 99 XXXXX
STABLE DESCENT
VN VL PHA PHT N1
V3 99 99 999 999 9999
V4 99 99 999 999 9999
STABLE CLIMB
V5 99 99 999 999 9999
V6 99 99 999 999 9999
OIP OIT ECW1 SSEL
V7 999 X99 XXXXX XXXXXXXXXXXXX
V8 999 X99 XXXXX XXXXXXXXXXXXX
NO STABLE FRAME CONDITION
PARAMETER DISPLAYED IF ASSOCIATED SENSOR INSTALLED

ENGINE CRUISE REPORT <01>

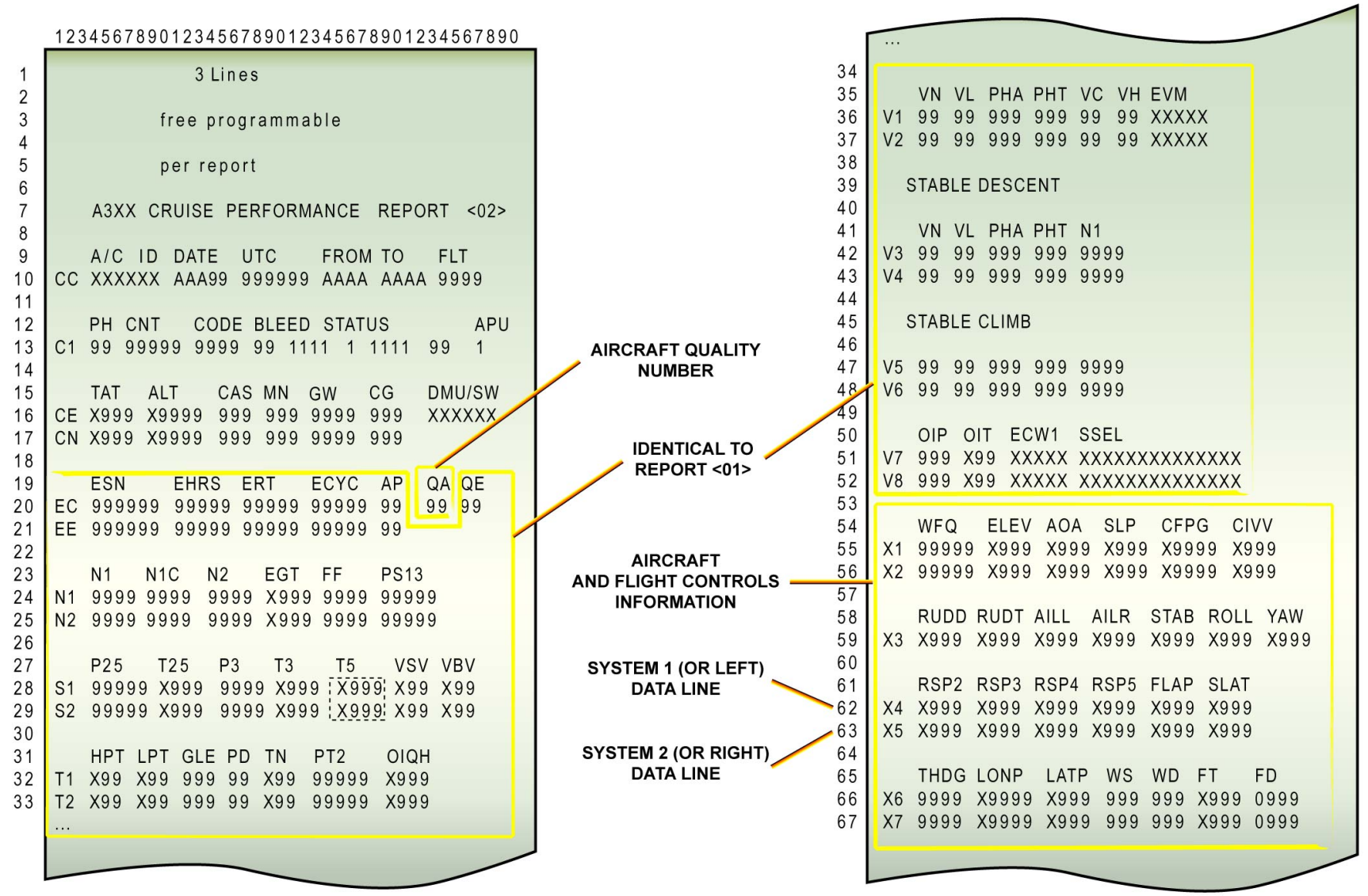
INDIVIDUAL PRINT REPORT DESCRIPTION (3)

CRUISE PERFORMANCE REPORT <02>

This report is similar to ENGINE CRUISE REPORT <01> except that more information is provided about the aircraft. The following data is added:
- QA: Aircraft quality number used as stability indicator for this report (00: best stability, 99: worst stability).
- WFQ: Inner cell fuel quantity,
- ELEV: Elevator position,
- AOA, SLP: Corrected Angle-Of-Attack and side slip angle,
- CFPG, CIVV: Last DMU calculated flight path acceleration and inertial vertical speed,
- ROLL, YAW: Roll angle and body axis yaw rate (average),
- THDG, LONP, LATP: True heading, longitude and latitude positions,
- WS, WD: Wind speed and direction (average),
- FT, FD: Fuel temperature and density (average),
- Flight controls positions (average). E.g. RSP5: Roll spoiler 5 position.

NOTE: Data lines X1, X4, X6 are issued from system 1 (e.g. FLAP system 1) or left (e.g. left spoiler 5) while data lines X2, X5, X7 are issued from system 2 or right.

In addition, the trigger logic for this report differs a little bit from the logic for ENGINE CRUISE REPORT <01> and is performed independently (e.g. the required stability period can be different).


12345678901234567890123456789012345678901234567890
3 Lines
free programmable
per report
A3XX CRUISE PERFORMANCE REPORT <02>
A/C ID DATE UTC FROM TO FLT
CC XXXXXX AAA99 999999 AAAA AAAA 9999
PH CNT CODE BLEED STATUS APU
C1 99 99999 9999 99 1111 1 1111 99 1
TAT ALT CAS MN GW CG DMU/SW
CE X999 X9999 999 999 9999 999 XXXXXX
CN X999 X9999 999 999 9999 999
ESN EHRS ERT ECYC AP QA QE
EC 999999 99999 99999 99999 99 99 99
EE 999999 99999 99999 99999 99
N1 N1C N2 EGT FF PS13
N1 9999 9999 9999 X999 9999 99999
N2 9999 9999 9999 X999 9999 99999
P25 T25 P3 T3 T5 VSV VBV
S1 99999 X999 9999 X999 X999 X99 X99
S2 99999 X999 9999 X999 X999 X99 X99
HPT LPT GLE PD TN PT2 OIQH
T1 X99 X99 999 99 X99 99999 X999
T2 X99 X99 999 99 X99 99999 X999
...
AIRCRAFT QUALITY NUMBER
IDENTICAL TO REPORT <01>
AIRCRAFT AND FLIGHT CONTROLS INFORMATION
SYSTEM 1 (OR LEFT) DATA LINE
SYSTEM 2 (OR RIGHT) DATA LINE
...
VN VL PHA PHT VC VH EVM
V1 99 99 999 999 99 99 XXXXX
V2 99 99 999 999 99 99 XXXXX
STABLE DESCENT
VN VL PHA PHT N1
V3 99 99 999 999 9999
V4 99 99 999 999 9999
STABLE CLIMB
V5 99 99 999 999 9999
V6 99 99 999 999 9999
OIP OIT ECW1 SSEL
V7 999 X99 XXXXX XXXXXXXXXXXXX
V8 999 X99 XXXXX XXXXXXXXXXXXX
WFQ ELEV AOA SLP CFPG CIVV
X1 99999 X999 X999 X999 X9999 X999
X2 99999 X999 X999 X999 X9999 X999
RUDD RUDT AILL AILR STAB ROLL YAW
X3 X999 X999 X999 X999 X999 X999 X999
RSP2 RSP3 RSP4 RSP5 FLAP SLAT
X4 X999 X999 X999 X999 X999 X999
X5 X999 X999 X999 X999 X999 X999
THDG LONP LATP WS WD FT FD
X6 9999 X9999 X999 999 999 X999 0999
X7 9999 X9999 X999 999 999 X999 0999

CRUISE PERFORMANCE REPORT <02>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE TAKE OFF REPORT <04>

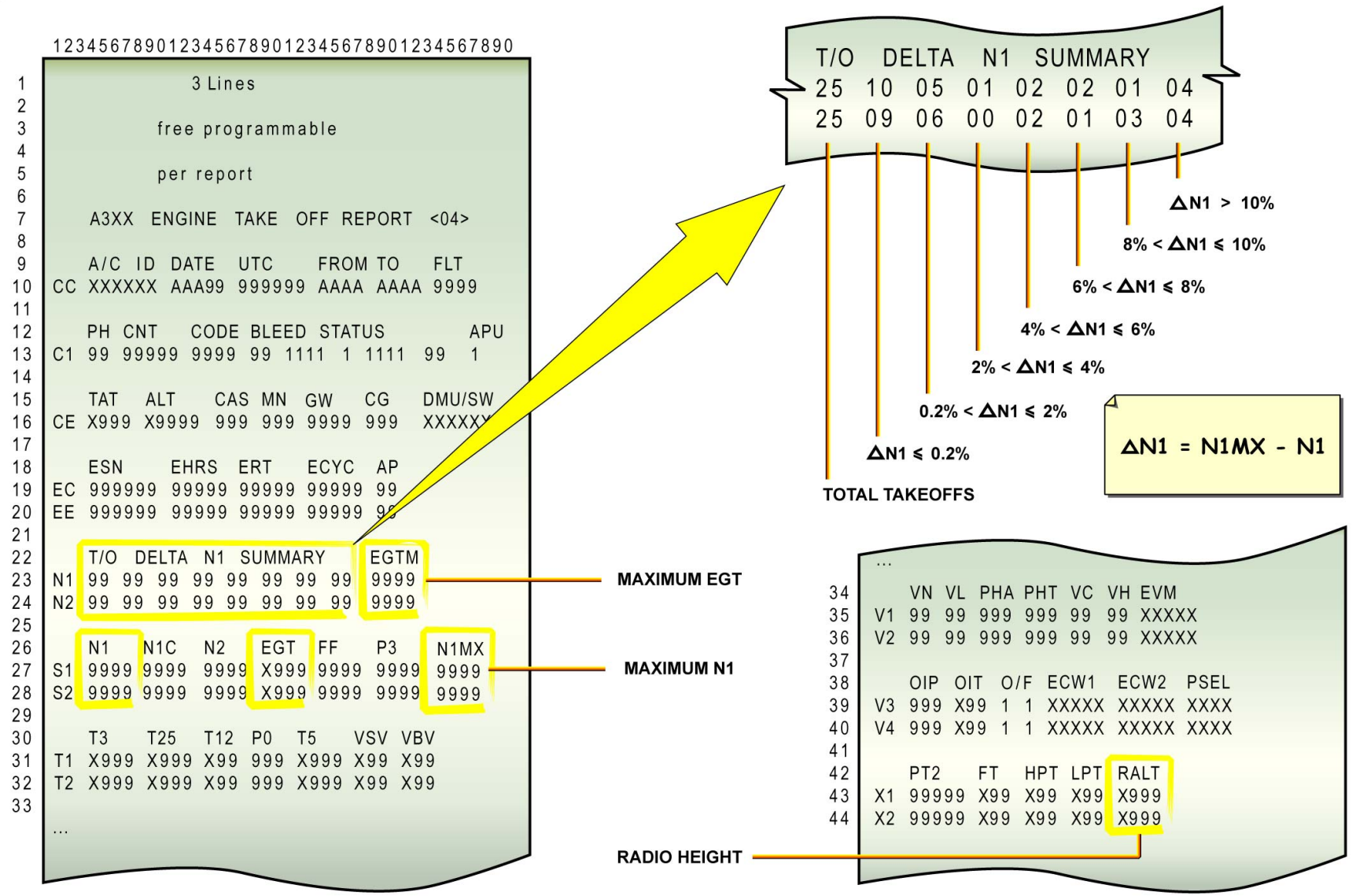
GENERAL

This report is generated while in the take off flight phase when the sum of the Exhaust Gas Temperature (EGT) for both engines is maximum. It is used to check the trend and the stress of the engines during take off. Basically, one report is generated per leg (programmable frequency). The report mainly contains data of both engines, including the maximum EGT (EGTM). The radio height (RALT), provided by radio altimeters 1 and 2, is also printed.

"T/O DELTA N1 SUMMARY" DATA

History of the difference between the maximum value of N1 (N1MX) and the actual N1 during previous takeoffs is provided for both engines. T/O DELTA N1 SUMMARY data is calculated a few seconds after entry into the take off flight phase, independently from the report trigger.

UGB13131 - U7ST0M0 - UM31DF000000001



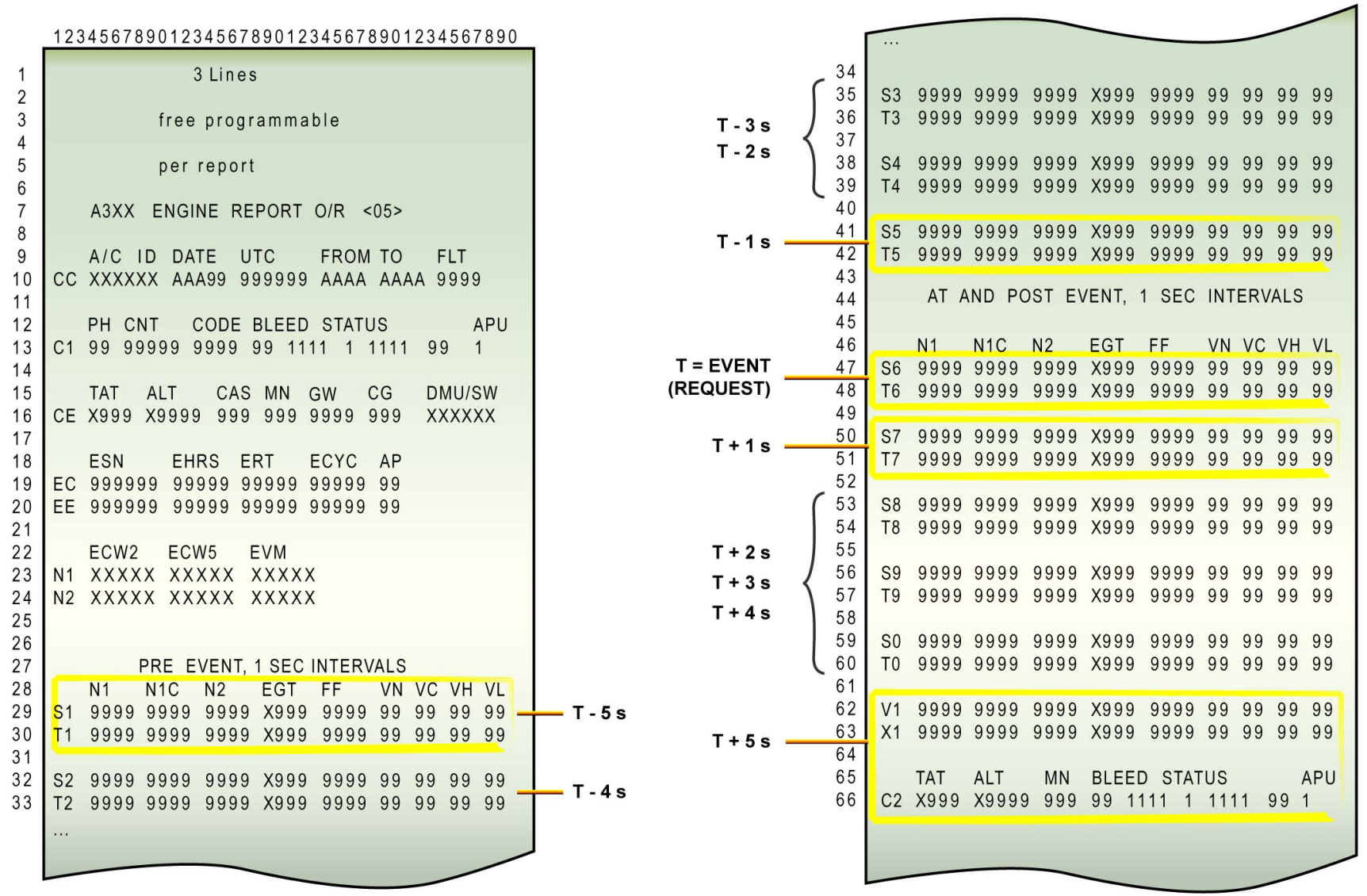
ENGINE TAKE OFF REPORT <04> - GENERAL & "T/O DELTA N1 SUMMARY" DATA

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE REPORT ON REQUEST <05>

The ENGINE REPORT ON REQUEST is a time series collection of engine parameters and is only generated on manual request. Parameters for both engines are recorded at 1 second intervals, from 5 seconds before the request to 5 seconds after.

UGB13131 - U7ST0M0 - UM31DF000000001



ENGINE REPORT ON REQUEST <05>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE GAS PATH ADVISORY REPORT <06>

GENERAL

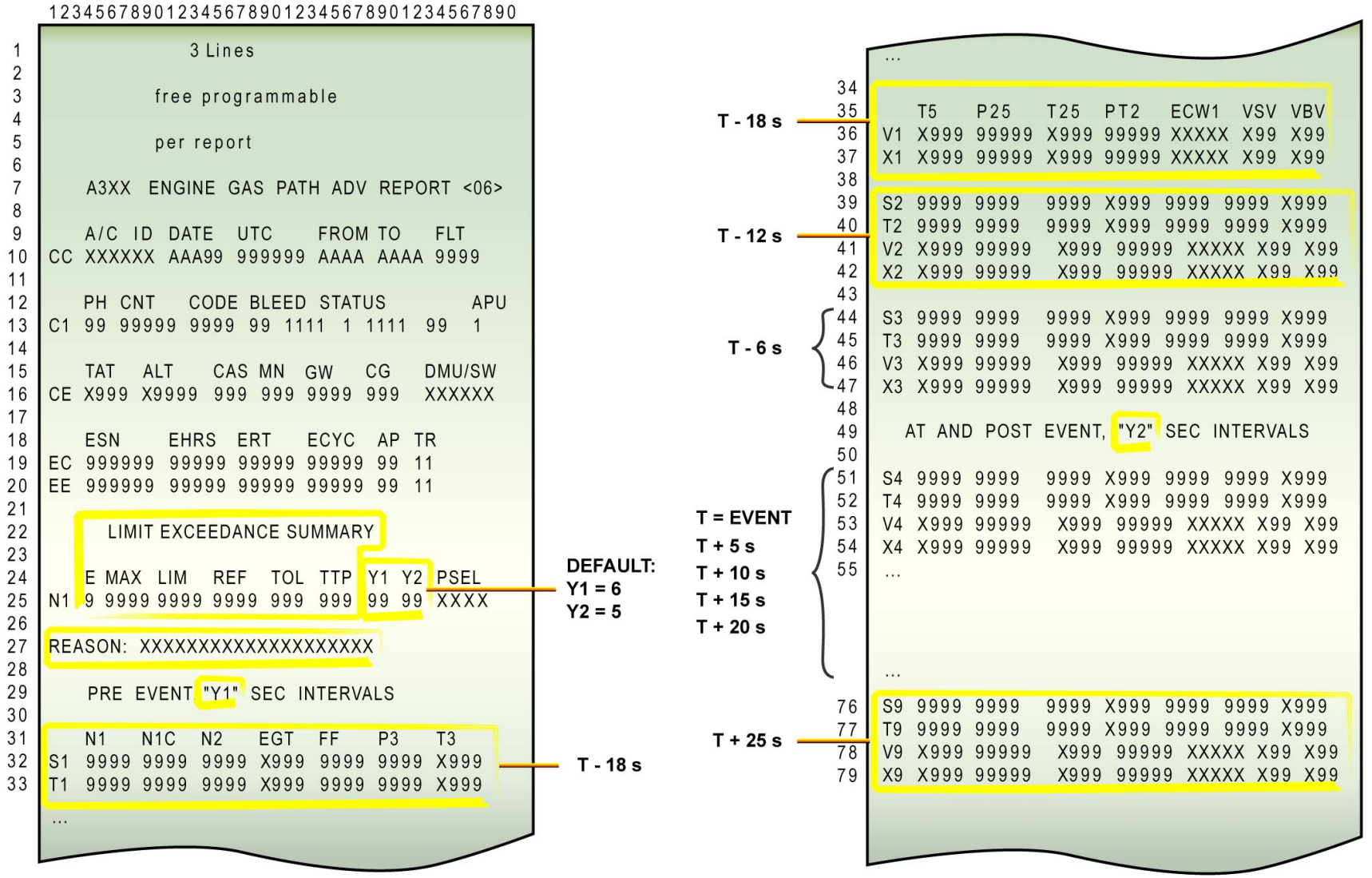
The engine gas path advisory report is generated by any of the following trigger conditions:
- stall condition detected on one engine,
- exceedance of one of the primary engine parameters (EGT, N1, N2) detected on one engine,
- fuel Shut Off-Valve (SOV) closed in flight for at least 4 seconds on one engine.

The reason for exceedance is displayed (STALL, EGT, N1, N2, SHUT DOWN). Basically, 3 sets of parameters for both engines are recorded at 6 seconds intervals before the event, 1 set at the event and 5 sets at 5 seconds intervals after the event. The length of the pre-event and post-event intervals (Y1 and Y2) is programmable. The number of datasets to be generated after the event is also programmable (up to 20). Report generation stops when this number is reached or when the exceedance parameters are again within their limit.

LIMIT EXCEEDANCE SUMMARY

The following data provides a summary on the exceedance that occurred:
- E: Engine (1 or 2) on which the exceedance occurred,
- MAX: Maximum value (peak) of the exceeded parameter,
- LIM: Programmable limit that was exceeded,
- REF: N2 at stall detection (for all other exceedance, zeros are printed),
- TOL: Time over limit during report generation,
- TTP: Time to peak during report generation.

UGB13131 - U7ST0M0 - UM31DF000000001



ENGINE GAS PATH ADVISORY REPORT <06> - GENERAL & LIMIT EXCEEDANCE SUMMARY

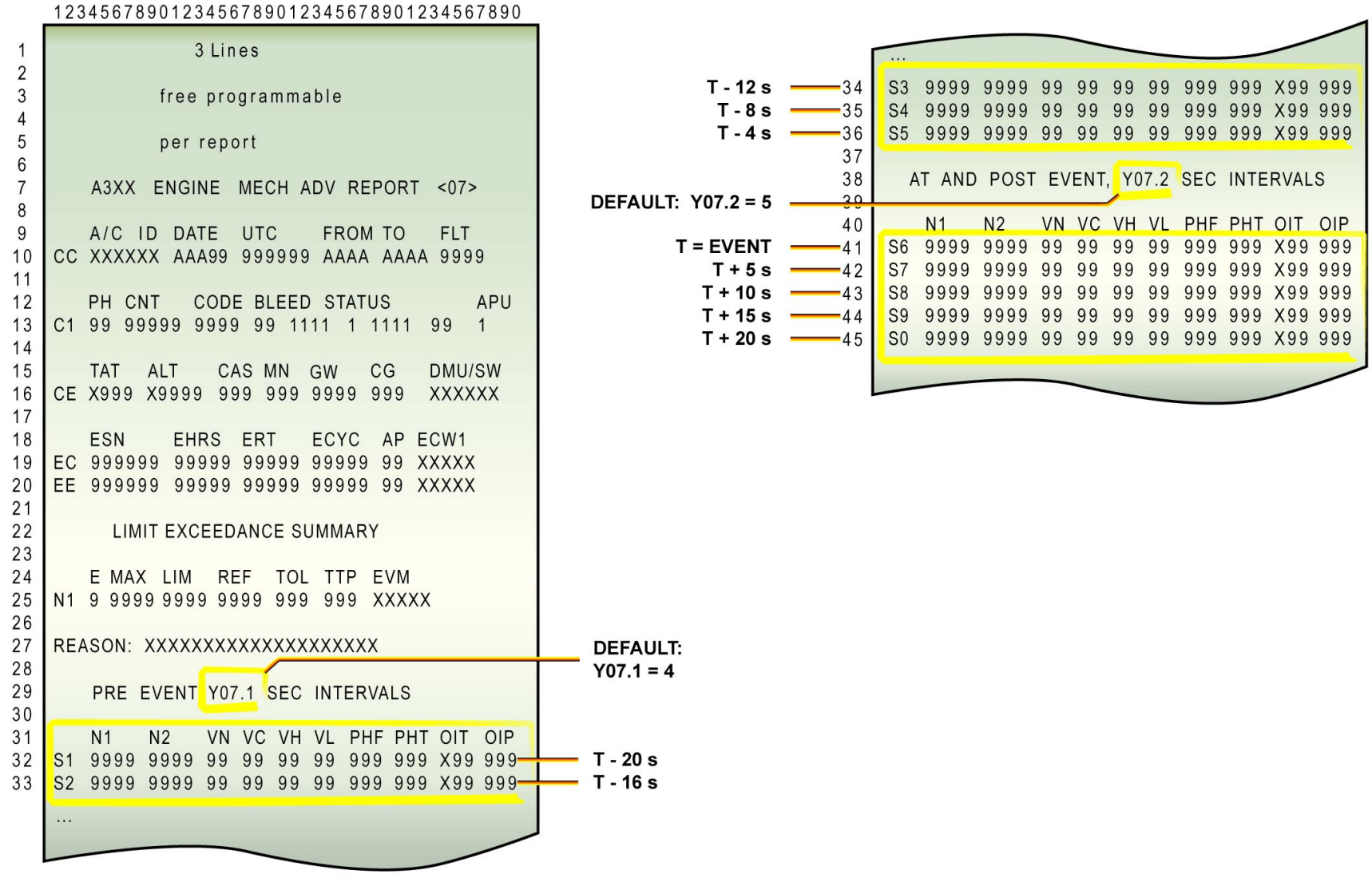
INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE MECHANICAL ADVISORY REPORT <07>

The ENGINE MECHANICAL ADVISORY REPORT is generated when an exceedance of one of the following secondary engine parameters is detected on one engine:
- engine Oil Inlet Temperature (OIT),
- engine oil pressure (OIP),
- vibrations of the engine Low Pressure (LP) rotor (VB1),
- vibrations of the engine High Pressure (HP) rotor (VB2).

The reason for exceedance is displayed (OIT, OIP, VB1, VB2). Basically, 5 sets of parameters for one engine are recorded at 4 seconds intervals before the event, 1 set at the event and 4 sets at 5 seconds intervals after the event. The length of the pre-event and post-event intervals (Y07.1 and Y07.2) is programmable.

UGB13131 - U7ST0M0 - UM31DF000000001



ENGINE MECHANICAL ADVISORY REPORT <07>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

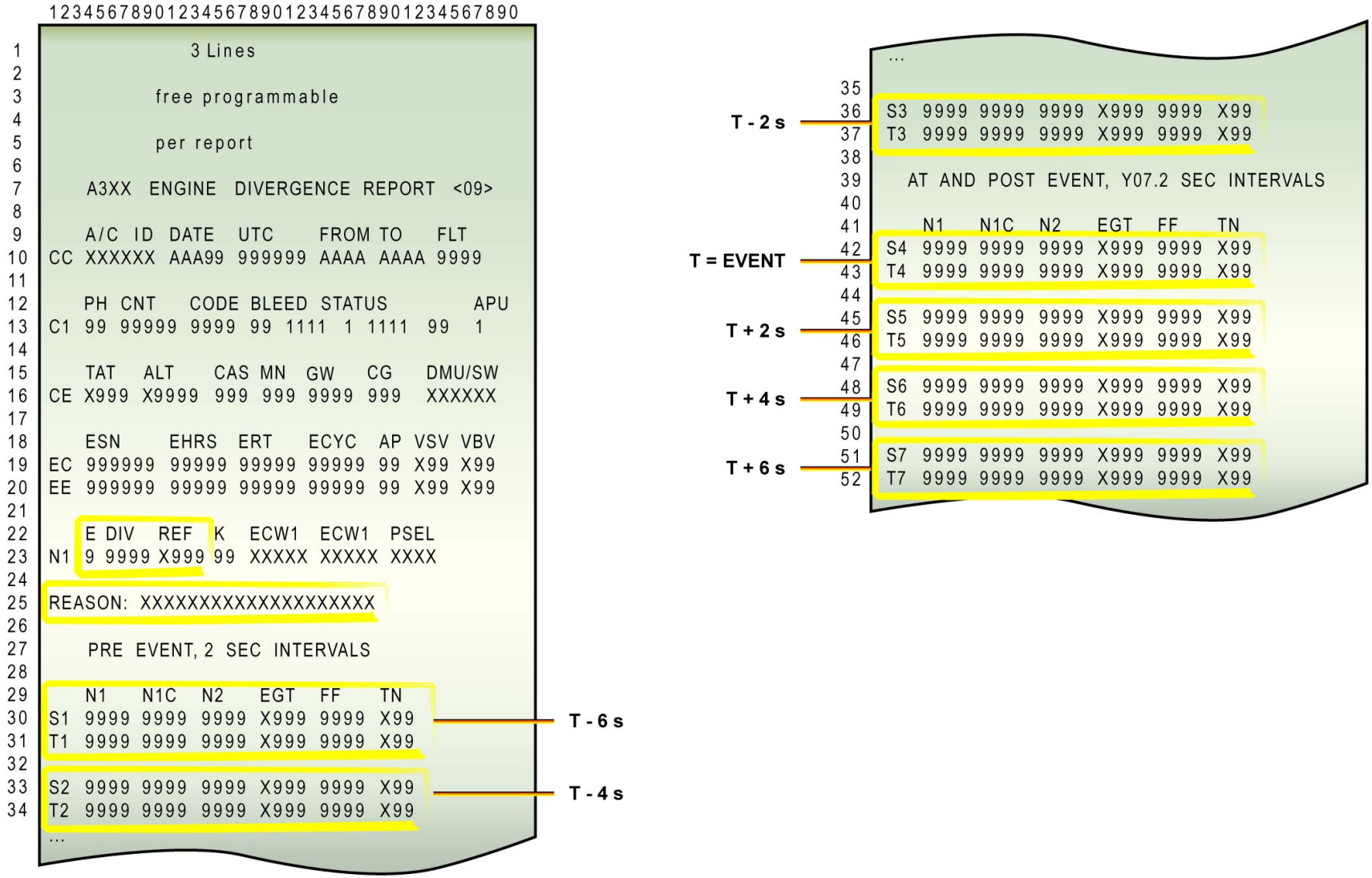
ENGINE DIVERGENCE REPORT <09>

This report is generated while in the climb or cruise flight phases when, under stabilized conditions, any of the following engine divergence conditions is detected:
- Exhaust Gas Temperature (EGT) divergence exceeding a programmed threshold,
- nacelle temperature (TN) divergence exceeding a programmed threshold.

The reason for divergence is displayed (EGT, TN). This report is intended to detect quick degradation in engine performance. 3 sets of parameters for both engines are recorded at 2 seconds intervals before the event, 1 set at the event and 3 sets at 2 seconds intervals after the event. In addition, the following data is provided:
- E: Divergent engine (1 or 2),
- DIV: Absolute divergence value of EGT (or TN),
- REF: Reference delta value of EGT (or TN).

Since two engines do not behave with the same performance characteristics, it is necessary to establish a reference delta for the divergence.
DIV = DIFF - REF, DIFF being the actual delta value of EGT (or TN) between both engines.

UGB13131 - U7ST0M0 - UM31DF000000001



ENGINE DIVERGENCE REPORT <09>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

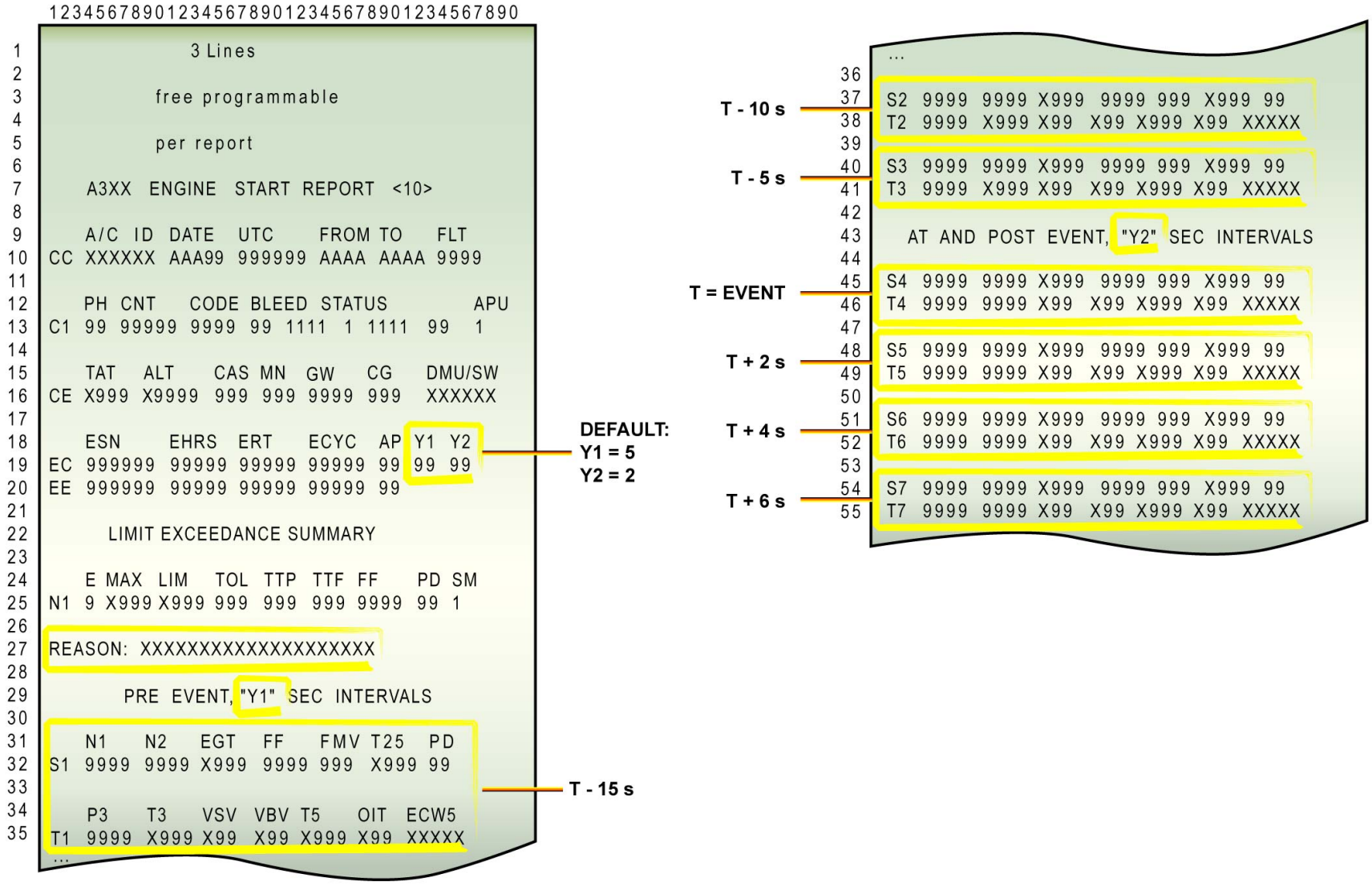
ENGINE START REPORT <10>

This report is generated in case of aborted engine start or EGT exceedance. The possible aborted start reasons are:
- starter air valve or HP Shut-Off Valve (SOV) demand/position disagree,
- EGT overtemperature,
- stall,
- no engine light off,
- hung start,
- illegal start sequence,
- slow start.

When effective, the reason is displayed (SAV, HPSOV, EGT, STALL, NO LIGHT OFF, HUNG, START FAIL, SLOW). "EGT" is also displayed in case of exceedance. Basically, 3 sets of parameters for one engine are recorded at 5 seconds intervals before the event, 1 set at the event and 3 sets at 2 seconds intervals after the event. The length of the pre-event and post-event intervals (Y1 and Y2) is programmable.

NOTE: The engine start report is also generated (with 7 post-event datasets):
- every 25 engine cycles (programmable frequency),
- every flight leg for 5 consecutive flight legs from initialization (programmable number, up to 9).

UGB13131 - U7ST0M0 - UM31DF000000001



ENGINE START REPORT <10>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE RUN UP REPORT <11>

This report is primarily generated on manual request. It contains the same data as the ENGINE CRUISE REPORT <01> plus corrected parameters for the ambient temperature. These corrected data are averages over a period of 20 seconds as well as most of the other report data (refer to the ENGINE CRUISE REPORT <01> topic).

UGB13131 - U7ST0M0 - UM31DF000000001

```
   12345678901234567890123456789012345678901234567890
 1                3 Lines
 2
 3              free programmable
 4
 5              per report
 6
 7       A3XX  ENGINE  RUN UP REPORT  <11>
 8
 9       A/C  ID  DATE   UTC     FROM TO    FLT
10    CC XXXXXX AAA99 999999 AAAA AAAA 9999
11
12       PH CNT    CODE BLEED STATUS         APU
13    C1 99 99999 9999 99 1111  1 1111  99   1
14
15       TAT   ALT    CAS MN  GW    CG    DMU/SW
16    CE X999 X9999  999 999 9999  999   XXXXXX
17
18       ESN     EHRS  ERT    ECYC  AP
19    EC 999999  99999 99999  99999 99
20    EE 999999  99999 99999  99999 99
21
22       N1    N1C  N2    EGT  FF     PS13
23    N1 9999  9999 9999  X99  9999   99999
24    N2 9999  9999 9999  X99  9999   99999
25
26       P25    T25   P3    T3    T5    VSV  VBV
27    S1 99999  X999  9999  X999  X999  X99  X99
28    S2 99999  X999  9999  X999  X999  X99  X99
29
30       HPT  LPT  GLE  PD  TN   PT2
31    T1 X99  X99  999  99  X99  99999
32    T2 X99  X99  999  99  X99  99999
33    ...
```

```
      ...
34       VN  VL  PHA  PHT  VC  VH  EVM
35    V1 99  99  999  999  99  99  XXXXX
36    V2 99  99  999  999  99  99  XXXXX
37
38       OIP   OIT   ECW1   SSEL
39    V3 999   X99   XXXXX  XXXXXXXXXXXXXX
40    V4 999   X99   XXXXX  XXXXXXXXXXXXXX
41
42       EGTK  N1K   N2K   FFK
43    X1 X999  9999  9999  9999
44    X2 X999  9999  9999  9999
```

CORRECTED PARAMETERS

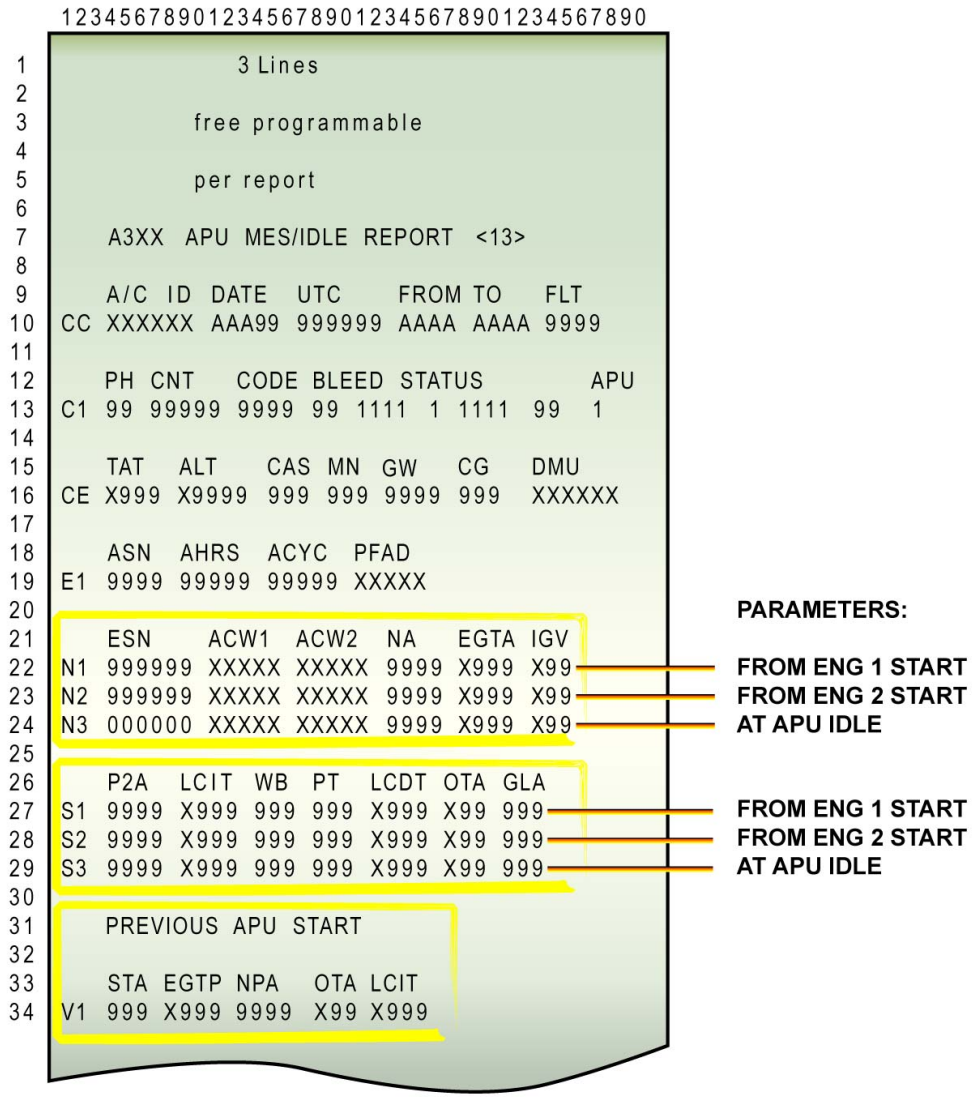
ENGINE RUN UP REPORT <11>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

APU MAIN ENGINE START/IDLE REPORT <13>

This report is generated once at the beginning of each new APU operating hour interval when a main engine is started with the APU. The APU operating hour interval is programmable. The report mainly contains operating data of the APU:
- from each Main Engine Start (MES) (lines N1, S1 and N2, S2). If the APU master switch is set to off before the second MES is terminated, lines N2 and S2 are filled with zeros,
- at APU idle (lines N3 and S3). In addition, line V1 contains data from the previous APU start.

UGB13131 - U7ST0M0 - UM31DF000000001


12345678901234567890123456789012345678901234567890
3 Lines
free programmable
per report
A3XX APU MES/IDLE REPORT <13>
A/C ID DATE UTC FROM TO FLT
CC XXXXXX AAA99 999999 AAAA AAAA 9999
PH CNT CODE BLEED STATUS APU
C1 99 99999 9999 99 1111 1 1111 99 1
TAT ALT CAS MN GW CG DMU
CE X999 X9999 999 999 9999 999 XXXXXX
ASN AHRS ACYC PFAD
E1 9999 99999 99999 XXXXX
ESN ACW1 ACW2 NA EGTA IGV
N1 999999 XXXXX XXXXX 9999 X999 X99
N2 999999 XXXXX XXXXX 9999 X999 X99
N3 000000 XXXXX XXXXX 9999 X999 X99
P2A LCIT WB PT LCDT OTA GLA
S1 9999 X999 999 999 X999 X99 999
S2 9999 X999 999 999 X999 X99 999
S3 9999 X999 999 999 X999 X99 999
PREVIOUS APU START
STA EGTP NPA OTA LCIT
V1 999 X999 9999 X99 X999
PARAMETERS:
FROM ENG 1 START
FROM ENG 2 START
AT APU IDLE
FROM ENG 1 START
FROM ENG 2 START
AT APU IDLE

APU MAIN ENGINE START/IDLE REPORT <13>

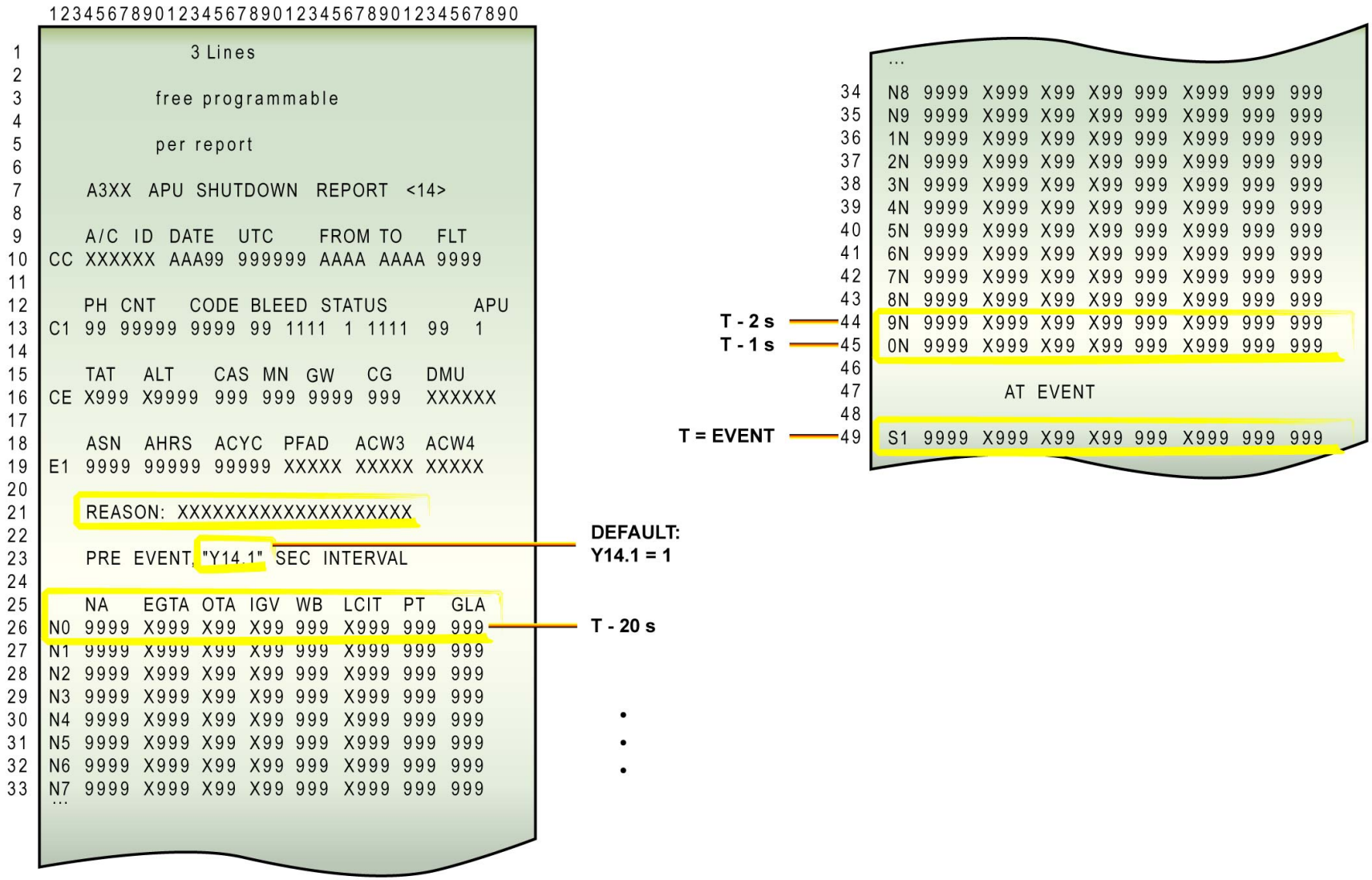
INDIVIDUAL PRINT REPORT DESCRIPTION (3)

APU SHUTDOWN REPORT <14>

This report is generated in case of abnormal APU shutdown. The possible shutdown reasons are:
- no flame,
- reverse flow,
- loss of DC power,
- high oil temperature,
- air intake not open,
- generator high oil temperature,
- overtemperature,
- sensor failure,
- no acceleration,
- start time exceeded,
- overspeed,
- Electronic Control Box (ECB) failure,
- low oil pressure,
- loss of speed,
- Inlet Guide Vane (IGV) failure.

When effective, the reason is displayed. Basically, 20 sets of APU parameters are recorded at 1 second intervals before the event and 1 set at the event. The length of the pre-event interval (Y14.1) is programmable.

UGB13131 - U7ST0M0 - UM31DF000000001



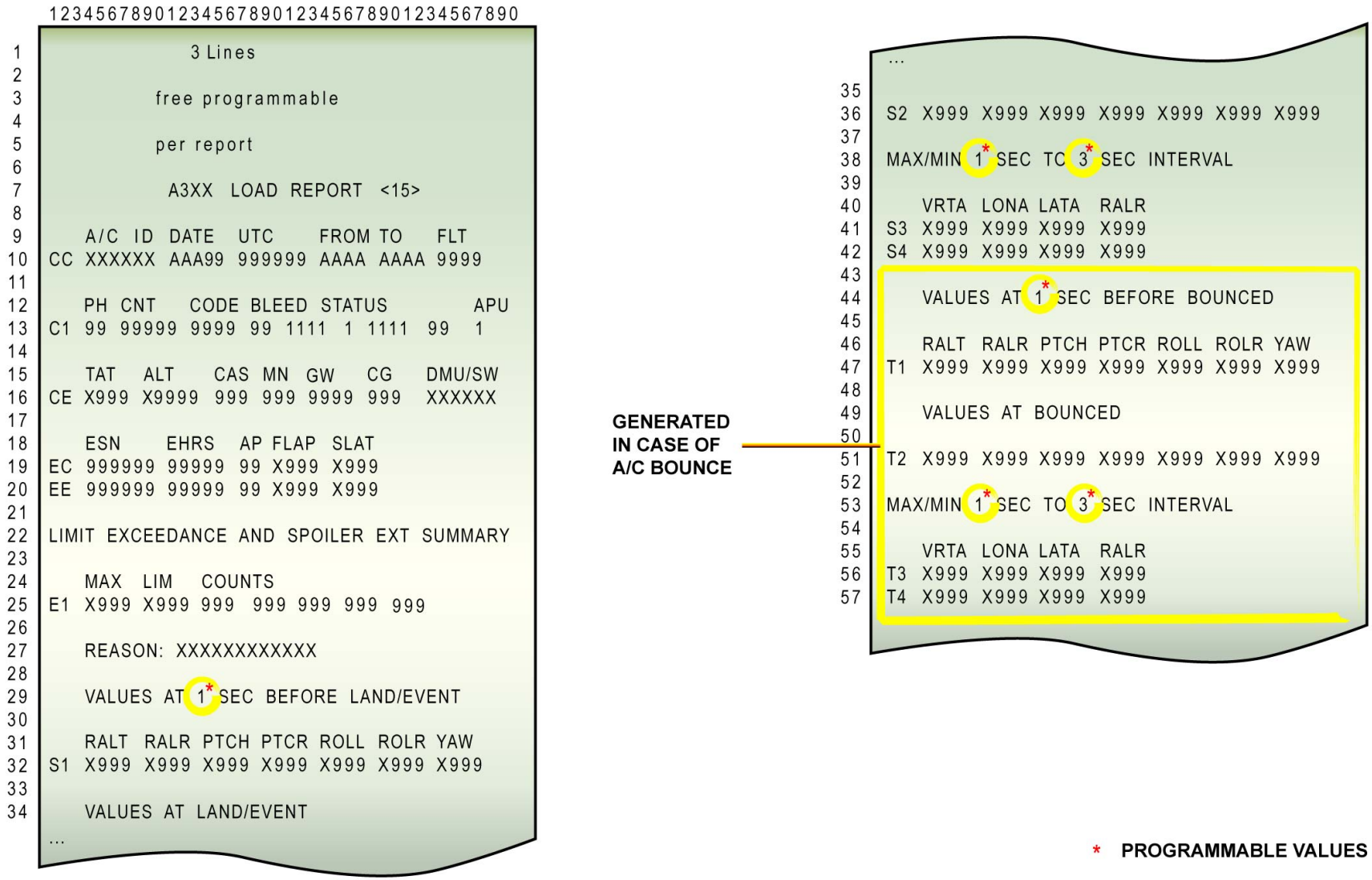
APU SHUTDOWN REPORT <14>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

LOAD REPORT <15>

Basically, this report is generated when excessive loads are applied to the airframe during landing. The report mainly contains aircraft aerodynamic data recorded before, at and after a hard landing. An aircraft bounce can also be detected. In that case, additional data lines T1 to T4 are also generated.

UGB13131 - U7ST0M0 - UM31DF000000001


1234567890123456789012345678901234567890
3 Lines
free programmable
per report
A3XX LOAD REPORT <15>
A/C ID DATE UTC FROM TO FLT
CC XXXXXX AAA99 999999 AAAA AAAA 9999
PH CNT CODE BLEED STATUS APU
C1 99 99999 9999 99 1111 1 1111 99 1
TAT ALT CAS MN GW CG DMU/SW
CE X999 X9999 999 999 9999 999 XXXXXX
ESN EHRS AP FLAP SLAT
EC 999999 99999 99 X999 X999
EE 999999 99999 99 X999 X999
LIMIT EXCEEDANCE AND SPOILER EXT SUMMARY
MAX LIM COUNTS
E1 X999 X999 999 999 999 999 999
REASON: XXXXXXXXXXXX
VALUES AT 1* SEC BEFORE LAND/EVENT
RALT RALR PTCH PTCR ROLL ROLR YAW
S1 X999 X999 X999 X999 X999 X999 X999
VALUES AT LAND/EVENT
...
...
S2 X999 X999 X999 X999 X999 X999 X999
MAX/MIN 1* SEC TO 3* SEC INTERVAL
VRTA LONA LATA RALR
S3 X999 X999 X999 X999
S4 X999 X999 X999 X999
VALUES AT 1* SEC BEFORE BOUNCED
RALT RALR PTCH PTCR ROLL ROLR YAW
T1 X999 X999 X999 X999 X999 X999 X999
VALUES AT BOUNCED
T2 X999 X999 X999 X999 X999 X999 X999
MAX/MIN 1* SEC TO 3* SEC INTERVAL
VRTA LONA LATA RALR
T3 X999 X999 X999 X999
T4 X999 X999 X999 X999
GENERATED IN CASE OF A/C BOUNCE
* PROGRAMMABLE VALUES

LOAD REPORT <15>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

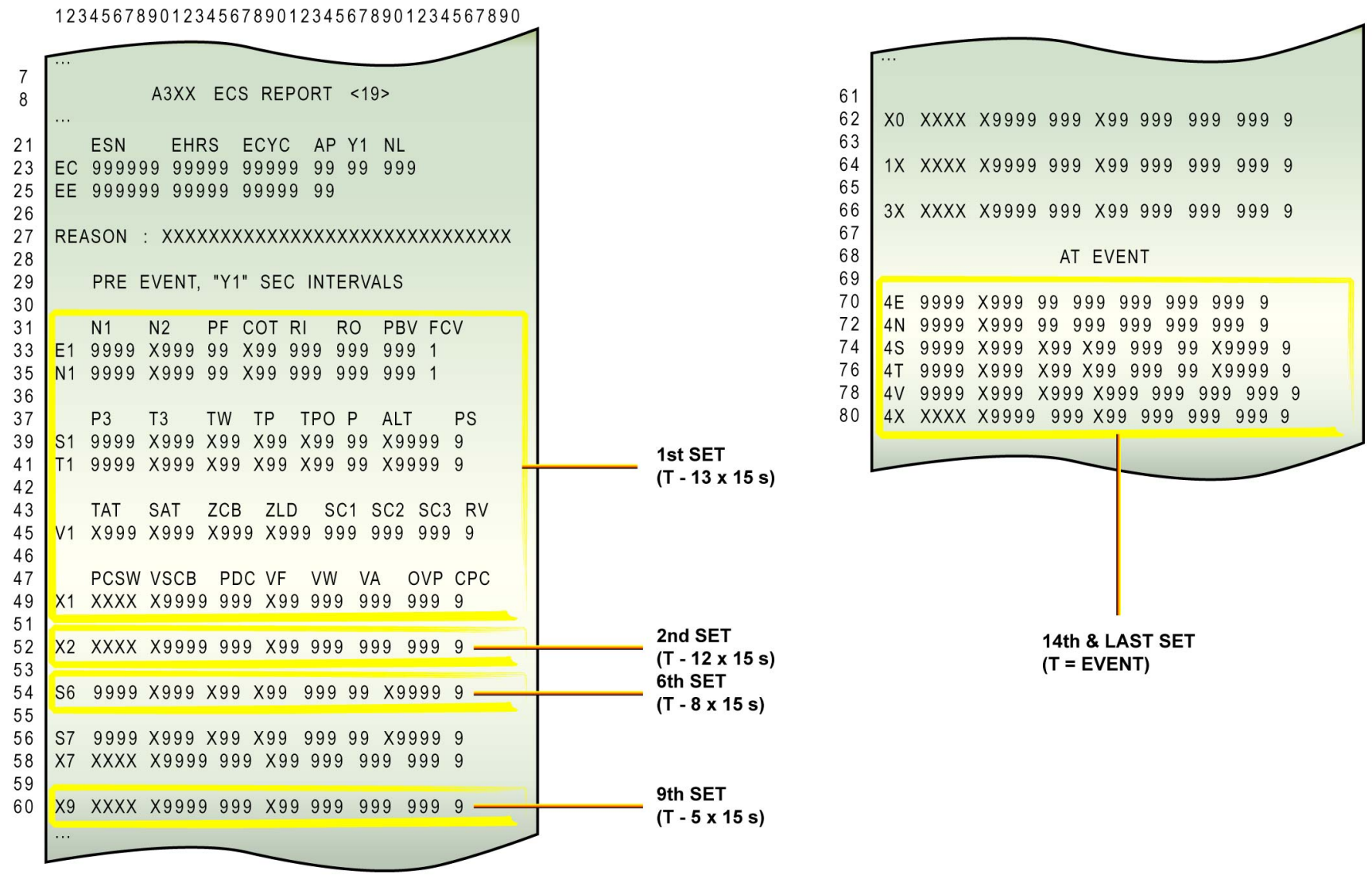
ENVIRONMENTAL CONTROL SYSTEM REPORT <19>

The environmental control system report is generated when there is a malfunction in the air conditioning or pressurization system. The reason for report generation is displayed (e.g. EXCESSIVE CABIN ALTITUDE). The report contains engine, aircraft and environmental data. Basically, up to 19 sets of parameters can be recorded at 15 seconds intervals before the event and 1 set at the event. The number of pre-event sets as well as the length of the pre-event interval (Y1) are programmable. In order to reduce the length of the report, a specific procedure is applied for report output:

- the first pre-event dataset is generated completely as well as the at event dataset,
- within the intermediate datasets, a line is only generated if the value of an included leading parameter has changed.

E.g.: Cabin altitude (ZCB) is observed for changes in each Vx line and causes the print out of one line when the change limit is exceeded (i.e. +/- 100 feet).

UGB13131 - U7ST0M0 - UM31DF000000001



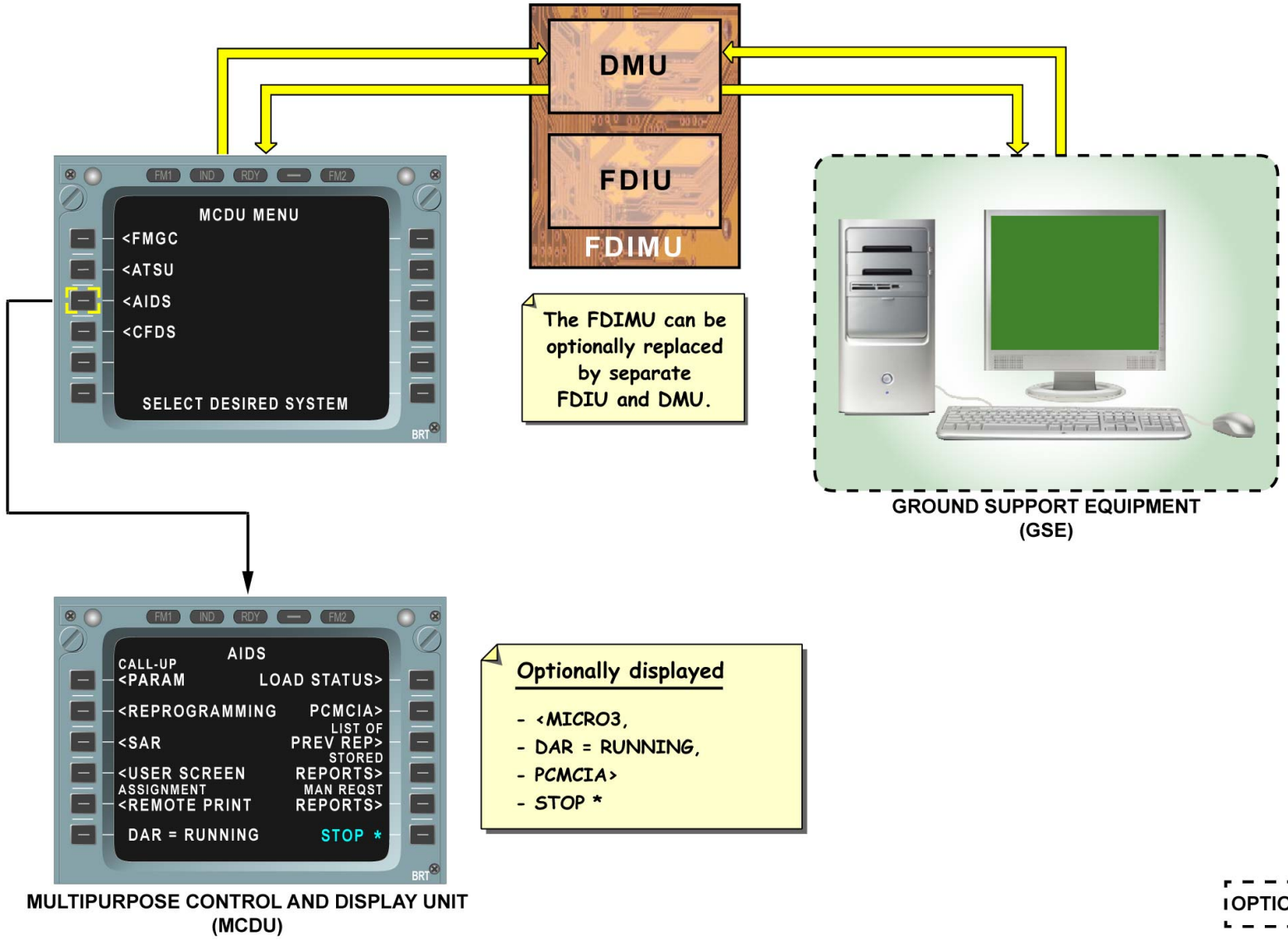
ENVIRONMENTAL CONTROL SYSTEM REPORT <19>

AIDS PROGRAMMING (3)

GENERAL

The Data Management Unit (DMU) is reprogrammable either with the assistance of the optional Ground Support Equipment (GSE) or partially (very limited) through the MCDU.

UGB13131 - U7ST0M0 - UM31DG000000001


DMU
FDIU
FDIMU
The FDIMU can be optionally replaced by separate FDIU and DMU.
MCDU MENU
<FMGC
<ATSU
<AIDS
<CFDS
SELECT DESIRED SYSTEM
GROUND SUPPORT EQUIPMENT (GSE)
AIDS
CALL-UP
<PARAM
LOAD STATUS>
<REPROGRAMMING
PCMCIA>
<SAR
LIST OF PREV REP>
<USER SCREEN ASSIGNMENT
STORED REPORTS>
<REMOTE PRINT
MAN REQST REPORTS>
DAR = RUNNING
STOP *
MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU)
Optionally displayed
- <MICRO3,
- DAR = RUNNING,
- PCMCIA>
- STOP *
OPTIONAL

GENERAL

AIDS PROGRAMMING (3)

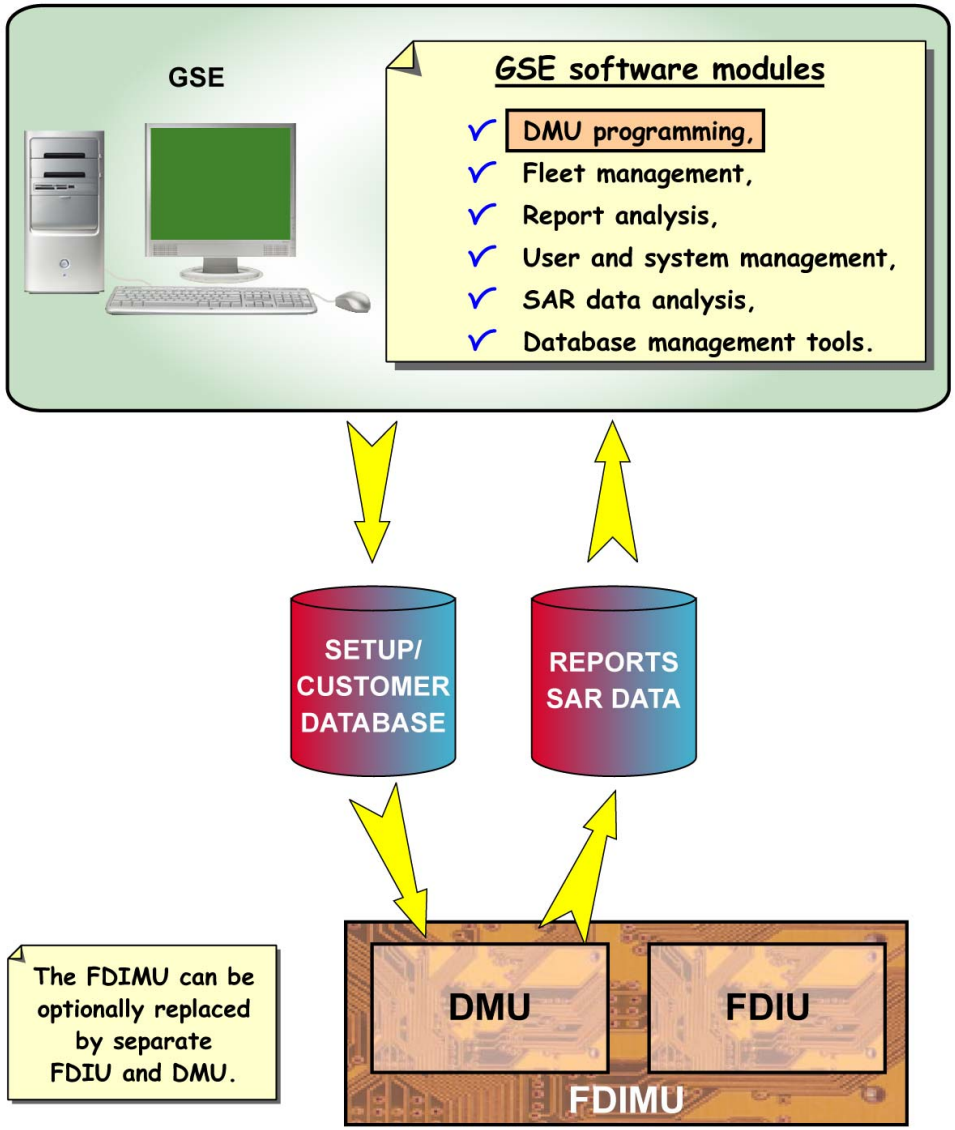
GSE

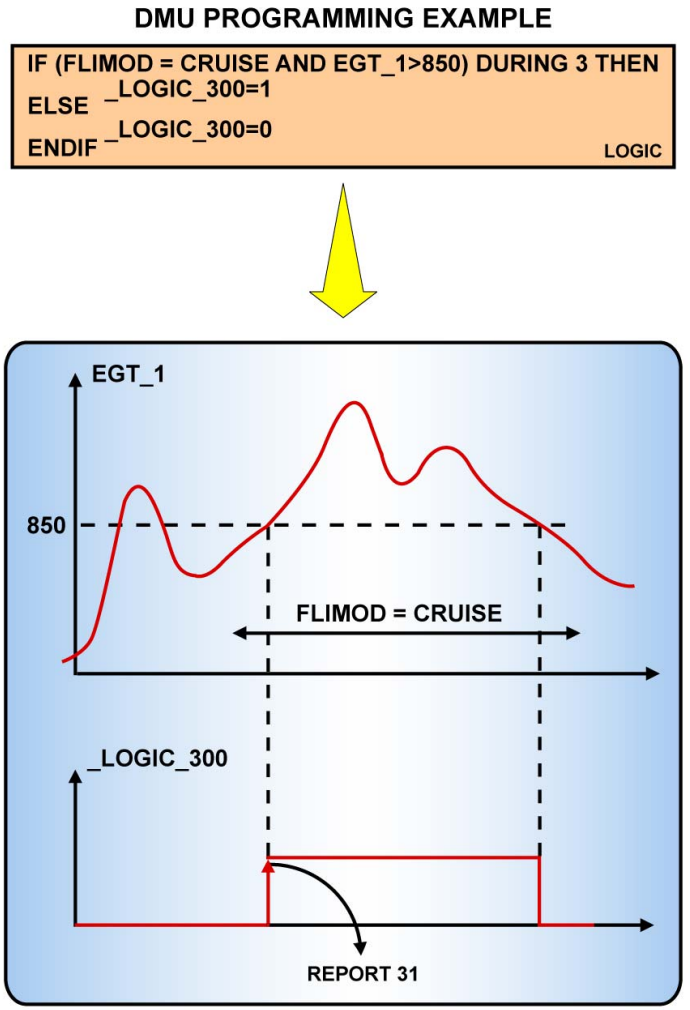
The GSE is based on a compatible personal computer and is divided into different software (S/W) modules. A major module is the programming of the DMU functions. It mainly enables:
- the adjustment of the standard reports (e.g. report limits),
- the addition of customer reports (numbered from 31 to 40),
- the addition of trigger conditions,
- the configuration of the Smart Access Recorder (SAR) and Digital AIDS Recorder (DAR) recording channels (DAR is optionally installed).

In particular, the GSE user has the possibility to program trigger conditions for:
- standard reports (additional conditions),
- programmable reports,
- SAR,
- DAR.

This programming is made by means of logics defined in a specific language. In the example given here, report 31 is associated to logic 300 and will be triggered when the Exhaust Gas Temperature (EGT) of engine 1 is greater than 850 °C for more than 3 seconds while in cruise flight phase. Once the programming is completed, another GSE module generates the associated database (i.e. setup/customer database). The database is stored on a floppy disk or a Personal Computer Memory Card International Association (PCMCIA) disk then transferred to the DMU through a Portable Data Loader (PDL) or the optional PCMCIA interface.

UGB13131 - U7ST0M0 - UM31DG000000001


GSE
GSE software modules
DMU programming,
Fleet management,
Report analysis,
User and system management,
SAR data analysis,
Database management tools.
SETUP/
CUSTOMER
DATABASE
REPORTS
SAR DATA
The FDIMU can be optionally replaced by separate FDIU and DMU.
DMU
FDIU
FDIMU


DMU PROGRAMMING EXAMPLE
IF (FLIMOD = CRUISE AND EGT_1>850) DURING 3 THEN
_LOGIC_300=1
ELSE
_LOGIC_300=0
ENDIF
LOGIC
EGT_1
850
FLIMOD = CRUISE
_LOGIC_300
REPORT 31

GSE

AIDS PROGRAMMING (3)

MCDU PROGRAMMING MENU

Programming with the MCDU is possible by pressing the PROGRAMMING line select key on the AIDS MENU page. A first page is displayed with the DMU-part of the Flight Data Interface and Management Unit (FDIMU) hardware (H/W) and S/W references:
- P/N is the Part Number of the DMU,
- D1 P/N is the Part Number of the operational S/W,
- the 3 following items of information concern the setup/customer database: VVVV is the version number, LLLL is the revision level, DDMMYY is the generation date.

A password, defined with the GSE, is required to access the following programming menus.

REPORT INHIBIT

Inhibition for all the reports of the printing and/or linking to the Air Traffic Service Unit (ATSU). The inhibition is effective until the next DMU power off.

REPORT LIMITS

Change, in a temporary way, of some report limits that are programmable by the GSE. The change is effective for a predefined number of days or legs (refer to the VALIDITY field).

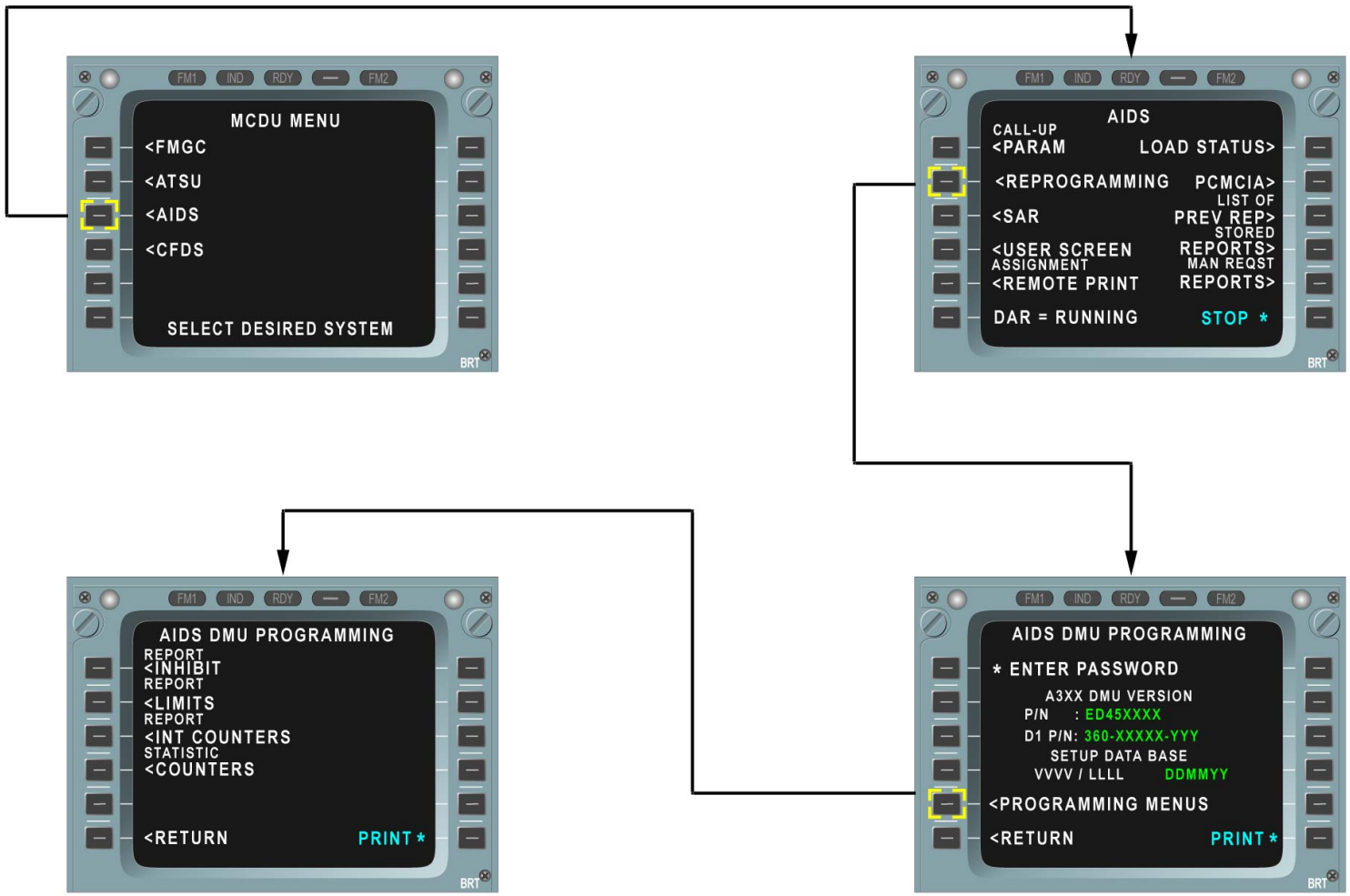
REPORT COUNTERS

Setting of the report internal counters at their corresponding limit value.

STATISTIC COUNTERS

Initialization and visualization of the engine/APU hours and cycles. The DMU resets the engine/APU hours and cycles in case of engine/APU change (engine/APU serial number change detection). The menu then allows the correct values to be programmed for an engine or APU after it has been changed.

UGB13131 - U7ST0M0 - UM31DG000000001



MCDU PROGRAMMING MENU - REPORT INHIBIT ... STATISTIC COUNTERS

PRINT REPORT STD HEADER DESCRIPTION (3)

GENERAL

A standard header is printed on each report. It is composed of information about the report at the top, information about the aircraft and the flight in the middle and general data at the bottom. The even number lines are always blank.

FREE PROGRAMMABLE LINES

The content of these three lines is free programmable to enable airline specific messages and is stored in the On Board Replaceable Module (OBRM) 2.

REPORT NAME

This line contains the report identification, title and number.

AIRCRAFT AND FLIGHT INFORMATION

Line CC contains the following data:
- A/C ID means aircraft identification (example: F-AIWW),
- DATE means date (example JUN01),
- UTC means Universal Time Coordinated (example: hours/minutes/seconds),
- FROM TO means city pair identification (example: LFBO (Toulouse) EDHI (Hamburg)),
- FLT means flight number (example: 0019).

GENERAL DATA

Each data line starts with two identification letters. In this example CC, C1 and CE are line identifiers. Lines C1 and CE contain the following data:
- PH 06 means flight phase 6,
- CNT 01204 means record counter. The three left most numbers are the numbers of reports that were previously initiated, either automatically or by the remote print button. The example shows 12 reports previously issued and the last report was 04: Take off report.
- CODE 4110 Trigger condition code,
- BLEED STATUS,
- Total Air Temperature (TAT) N435 means -43.5 °C,
- ALT 30000 means 30.000 feet,
- CAS 180 means 180 kts,
- MN 7000 means 0.700 Mach,
- Gross Weight (GW) 6000 means 60.000 kg,
- CG 250 means Center of Gravity at 25% Mean Aerodynamic Chord (MAC),
- DMU/SW BO is the Data Management Unit (DMU) software (S/W) identification and OBRM 1 S/W identification. G1 is the OBRM 2 S/W identification.

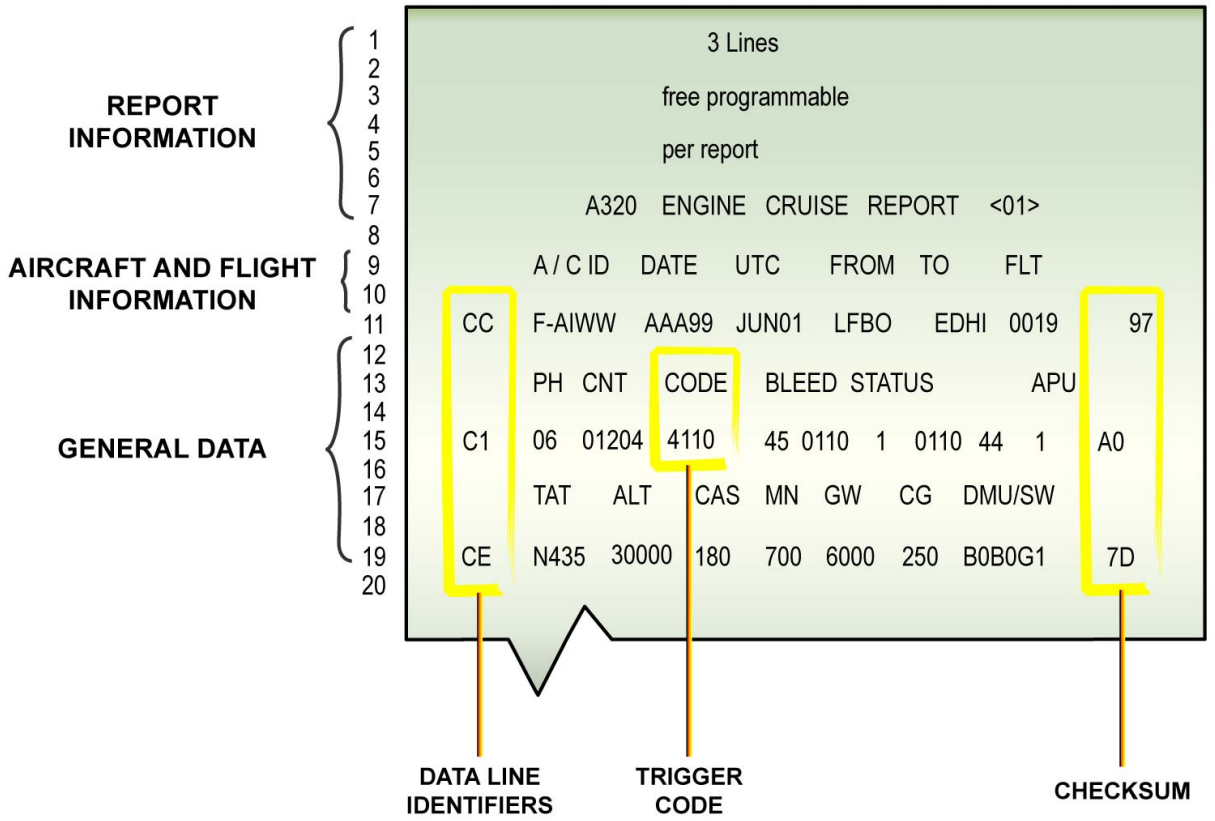
A checksum is printed in two hexadecimal characters at the end of each data line. In this example 97, A0 and 7D are the checksum of the data lines.

TRIGGER CONDITION CODE

To identify the trigger condition that caused the generation of a report, a numerical code is provided:
- 1000: Manual selection via MCDU,
- 2000: Flight phase dependent manual selection via Aircraft Integrated Data System (AIDS) PRINT P/B if programmed by the airline,
- 3000: Start logic programmed by the airline,
- 4000 to 7000: Report triggered by a combination of logic conditions (refer to Aircraft Maintenance Manual (AMM) 31-36-00 for the detailed trigger logics associated to each report),

In this example, the code is 4110. The three left most digits are the logic code number, which has triggered the report. The right most digit shows the number of the consecutive reports issued or it shows

a "T" if the report was triggered via Aircraft Communication Addressing and Reporting System (ACARS).



GENERAL ... GENERAL DATA

This Page Intentionally Left Blank

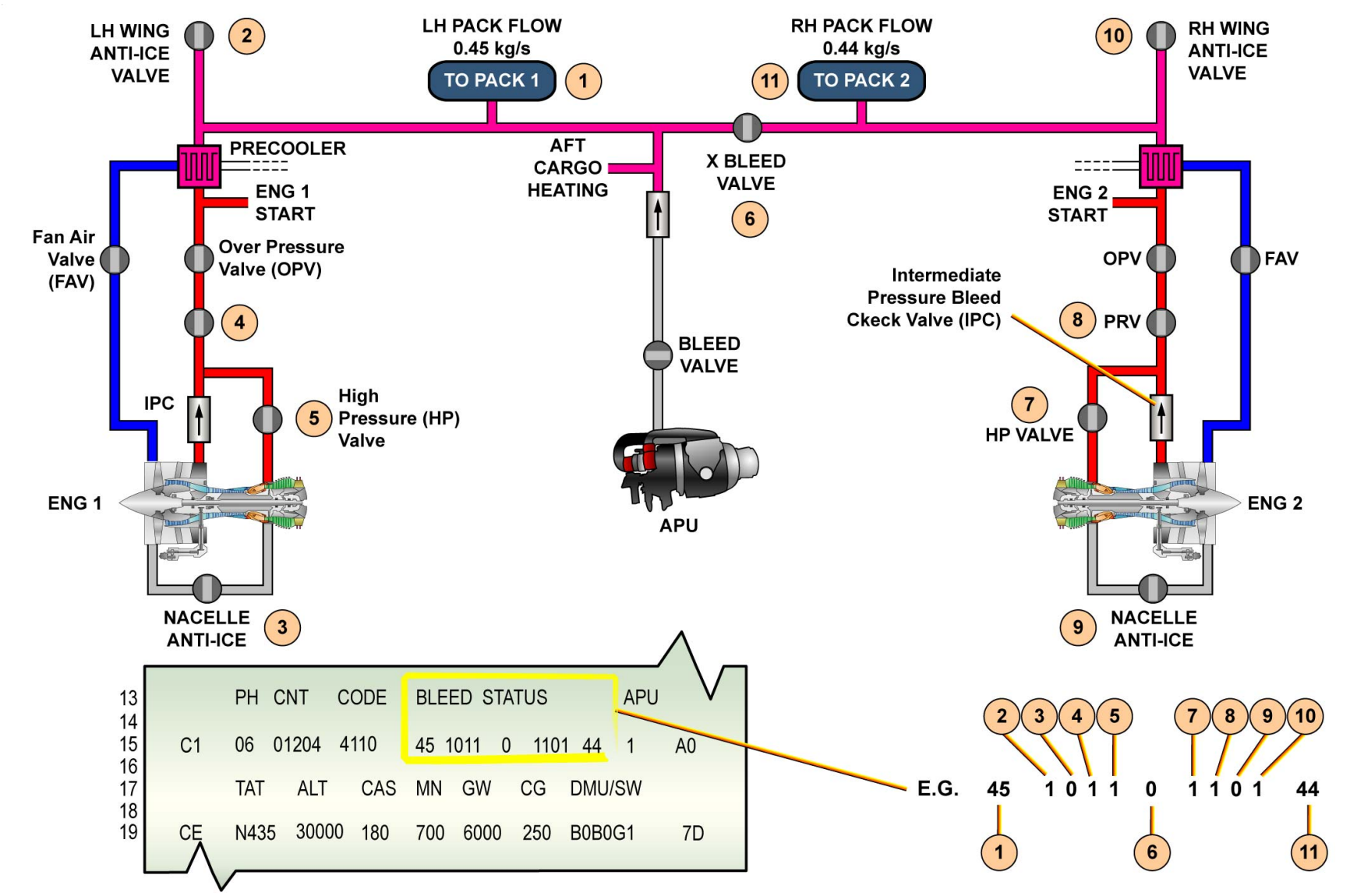
PRINT REPORT STD HEADER DESCRIPTION (3)

GENERAL DATA (continued)

BLEED STATUS

Bleed status is indicated with discrete coded information and numerical values. In the discrete coded information, 0 indicates that the valve is closed and 1 indicates that the valve is open.

UGB13131 - U7ST0M0 - UM31DE000000002



GENERAL DATA - BLEED STATUS

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

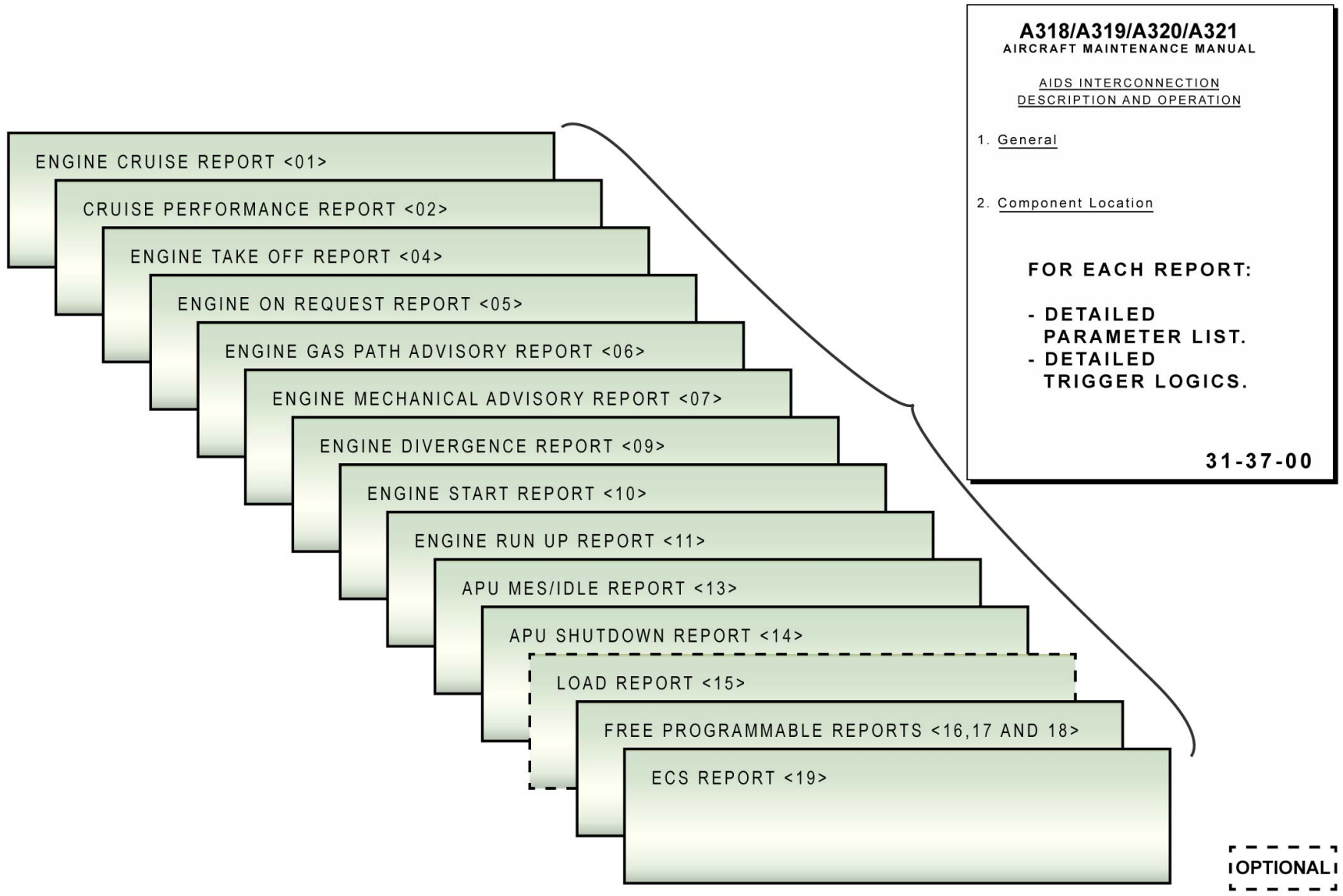
GENERAL

A report is a comprehensive set of data related to a specific event (e.g. limit exceedance of engine parameters). The parameters contained in the reports are among the parameters provided with an alpha call-up (refer to Aircraft Maintenance Manual (AMM) 31-37-00 for the detailed parameter list associated to each report). The Data Management Unit (DMU) processes up to 16 different types of report:
- 13 standard reports for basic aircraft, engine and APU monitoring. These reports have fixed trigger mechanism, fixed data collection and fixed output formatting. Nevertheless, certain constants and limits within fixed trigger logics are reprogrammable. Specific trigger conditions can be created for each report by means of the Ground Support Equipment (GSE).
- 3 free programmable reports, numbered from 16 to 18, for airline specific investigation and trouble shooting.

In addition to the automatic trigger logics, all the print reports can be generated from the MCDU. During any flight phase the relevant report may be generated and printed using the remote print button located on the center pedestal.

NOTE: S:
- In this module, reports are given for a CFM engine. They may be slightly different to your aircraft configuration.
- Depending on the DMU, which is fitted on your aircraft, the LOAD REPORT <15> may not be applicable.

UGB13131 - U7ST0M0 - UM31DF000000002



GENERAL

UGB13131 - U7ST0M0 - UM31DF000000002

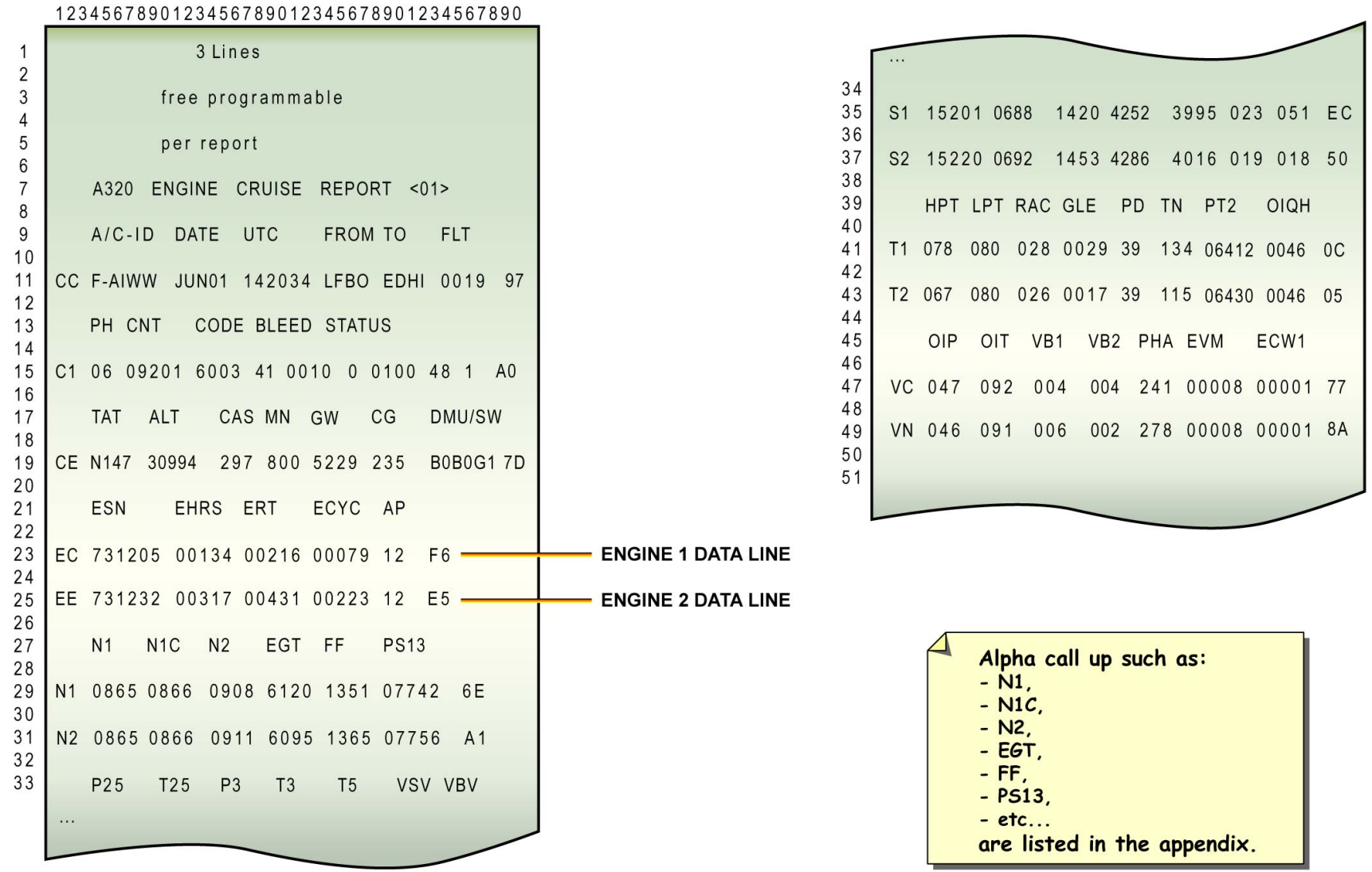
INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE CRUISE REPORT <01>

The report is generated when the aircraft is in stable cruise condition. It records operating conditions of engine 1 and 2 plus autopilot engagement status and generator load. All data is an average over 20 seconds with the exception of:
- Engine Serial Number (ESN),
- oil consumption,
- Engine flight hours (EHRS),
- Engine cycle (ECYC).

NOTE: In this lesson the reports are given as an example and will not be customized. They may differ from what you will actually find on your aircraft. Parameters are given for a CFM engine. This may be different to your aircraft configuration.

UGB13131 - U7ST0M0 - UM31DF000000002



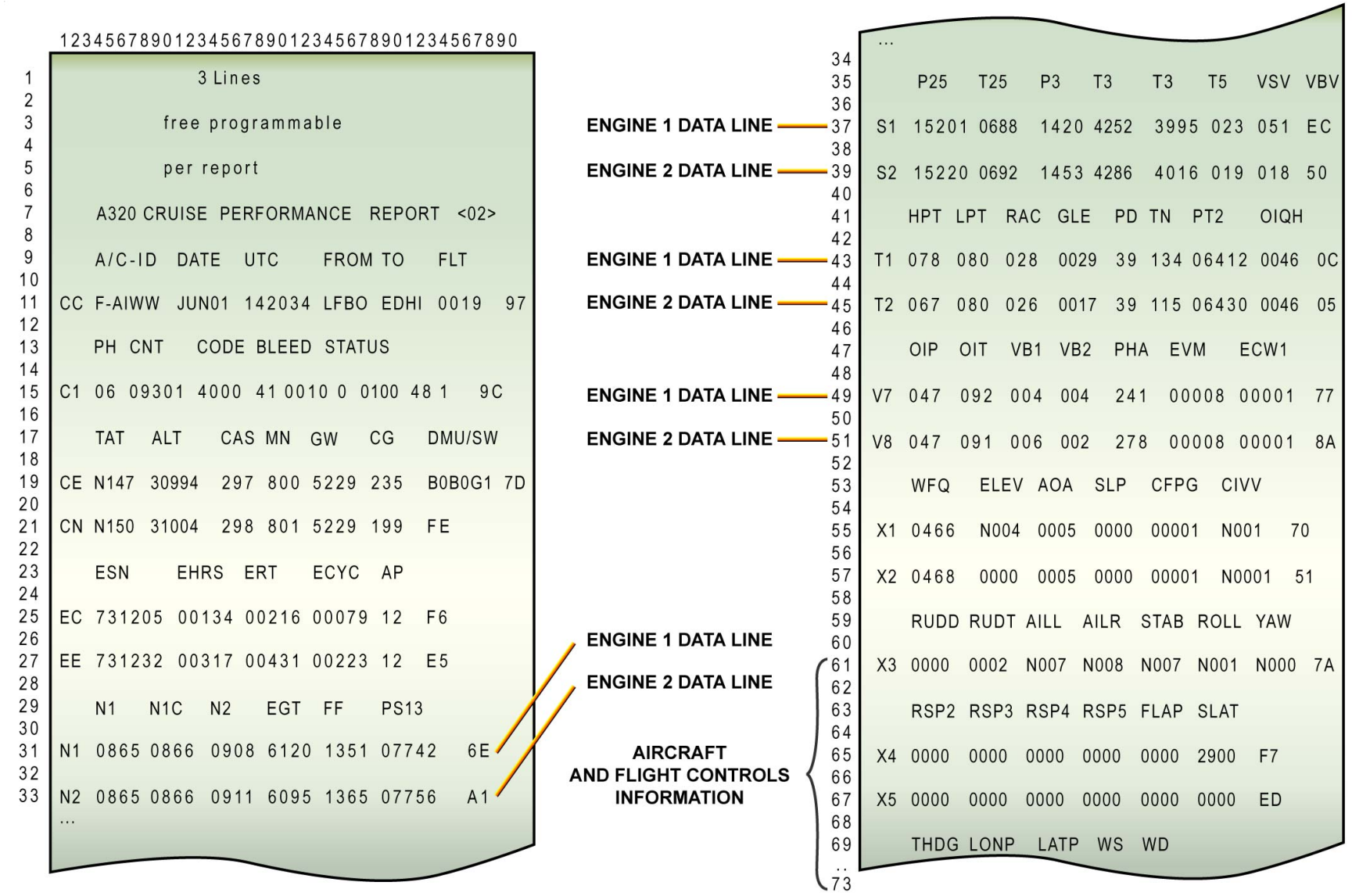
ENGINE CRUISE REPORT <01>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

CRUISE PERFORMANCE REPORT <02>

This report is similar to report <01> except that reports are sampled for longer periods and more information is provided about the aircraft.

UGB13131 - U7ST0M0 - UM31DF000000002



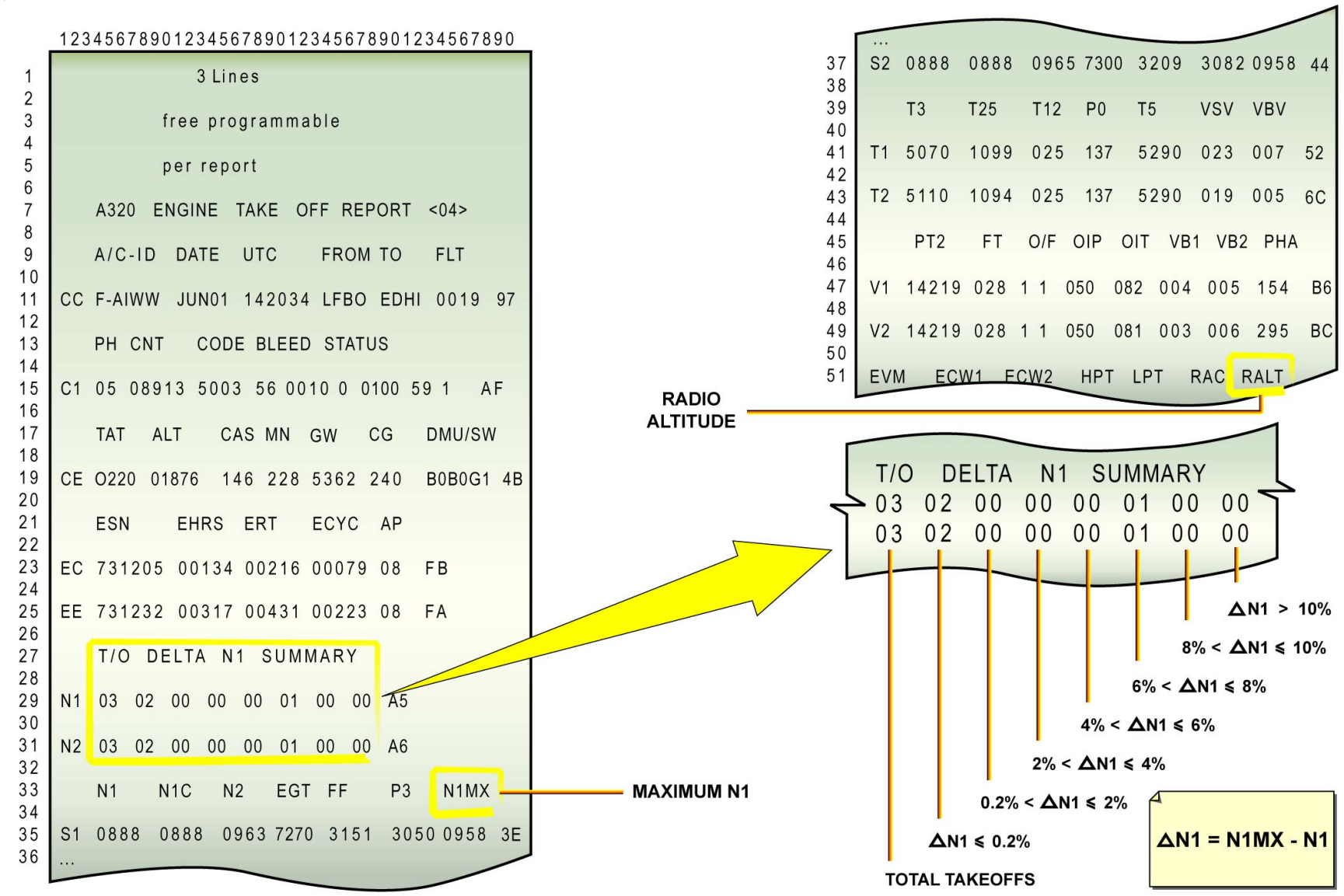
CRUISE PERFORMANCE REPORT <02>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE TAKE OFF REPORT <04>

This report is generated a few seconds after takeoff (TO). The number of intervals between each engine TO report is programmable. It contains engine data at TO and radio altitude. T/O DELTA N1 SUMMARY is an history of N1 value compared to N1max for all the last takeoffs since the last generated report (Code 4000). This concerns both engines. This history is erased in case of engine replacement.

UGB13131 - U7ST0M0 - UM31DF000000002



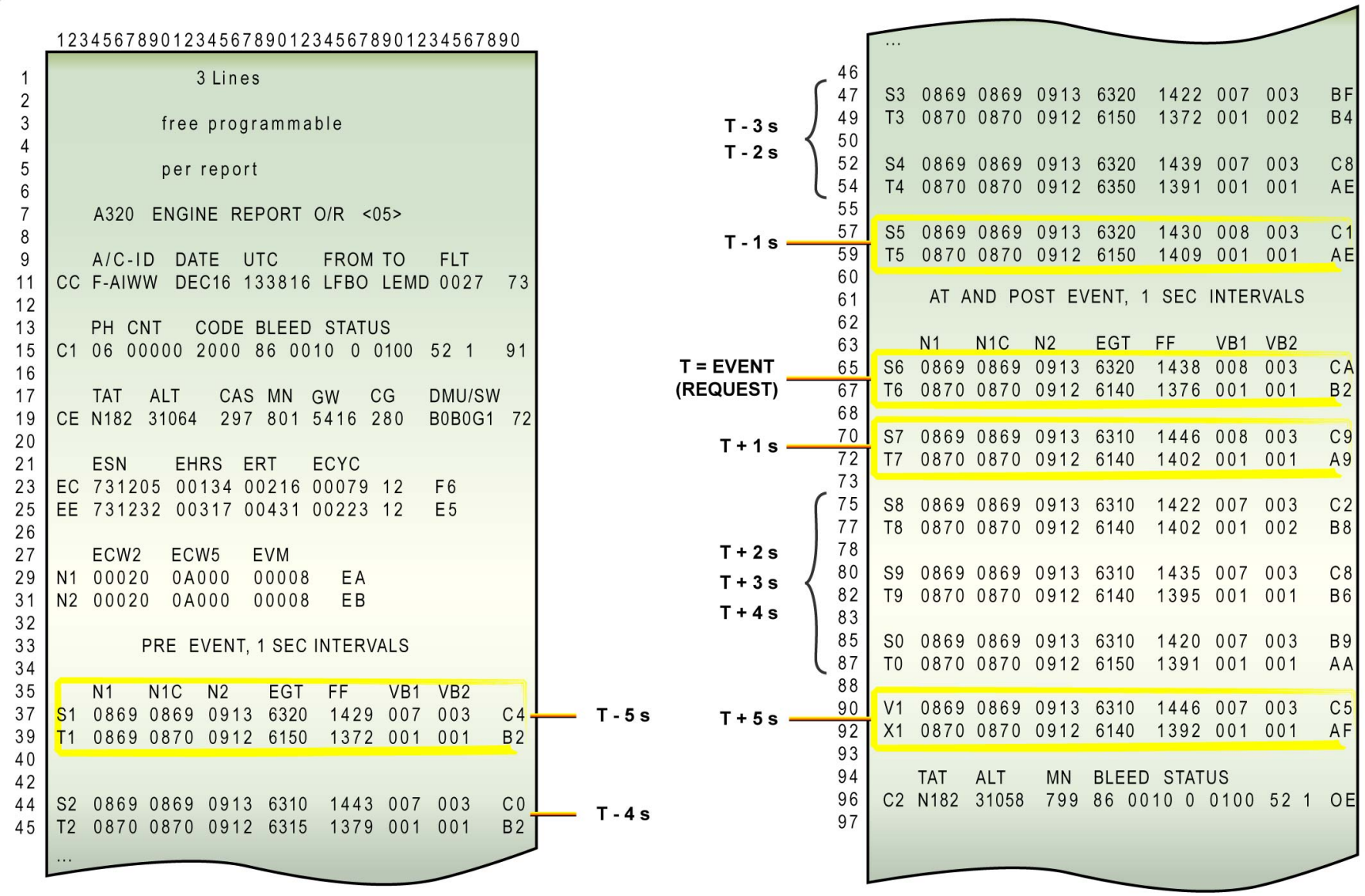
ENGINE TAKE OFF REPORT <04>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE ON REQUEST REPORT <05>

This report is generated in flight phases 1 to 3 by manual request. The parameters recorded are taken in 1 s intervals from 5 s before the request to 5 s after the request.

UGB13131 - U7ST0M0 - UM31DF000000002



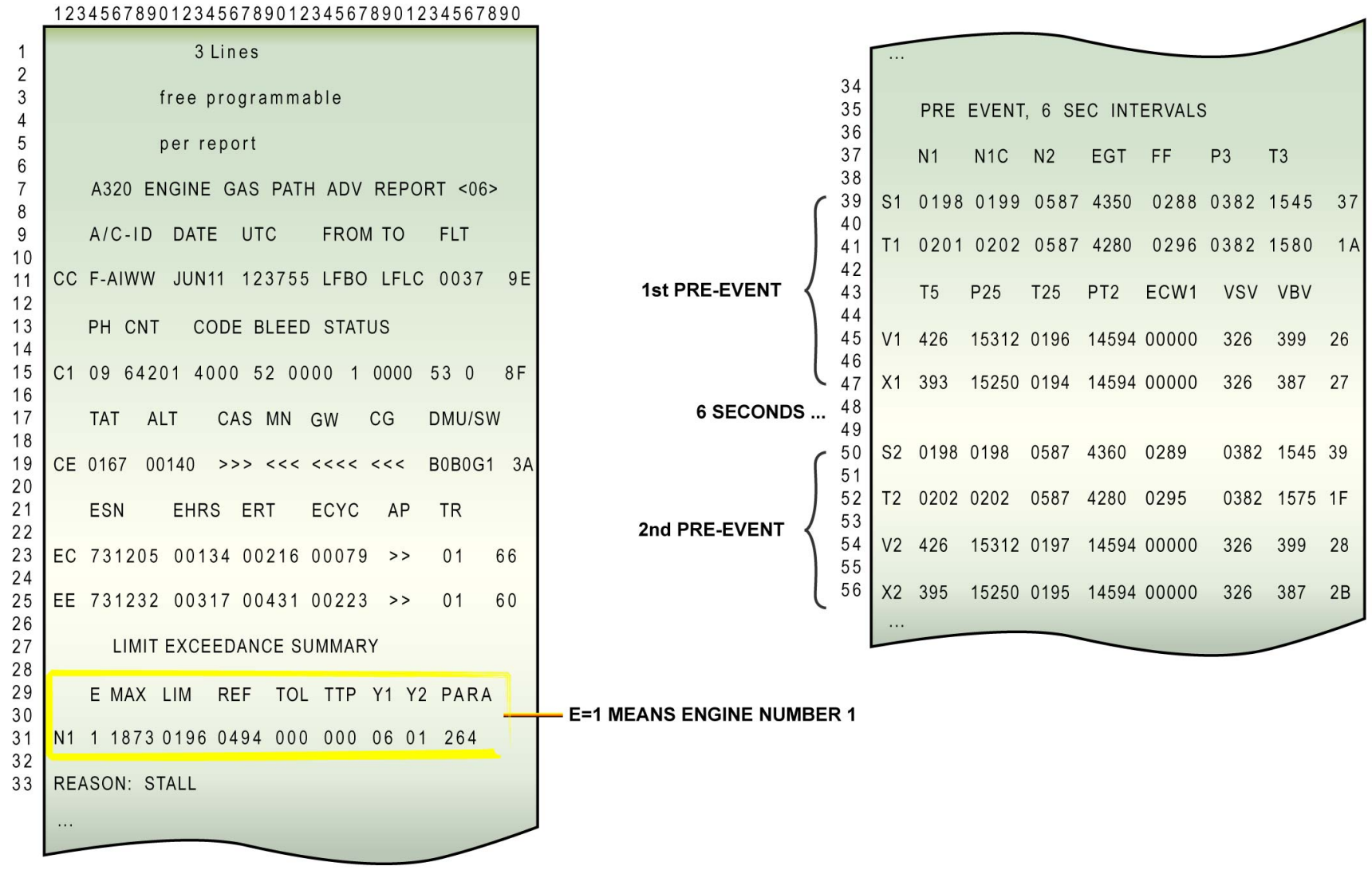
ENGINE ON REQUEST REPORT <05>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE GAS PATH ADVISORY REPORT <06>

This report is generated when one of the following conditions is met:
- engine stall,
- N1 limit exceeded,
- N2 limit exceeded,
- Exhaust Gas Temperature (EGT) limit exceeded,
- engine auto shutdown.

There is one report for each engine. 3 sets of parameters are recorded at 6 s intervals before the event and 5 sets are recorded at 1 s intervals after the event.



ENGINE GAS PATH ADVISORY REPORT <06>

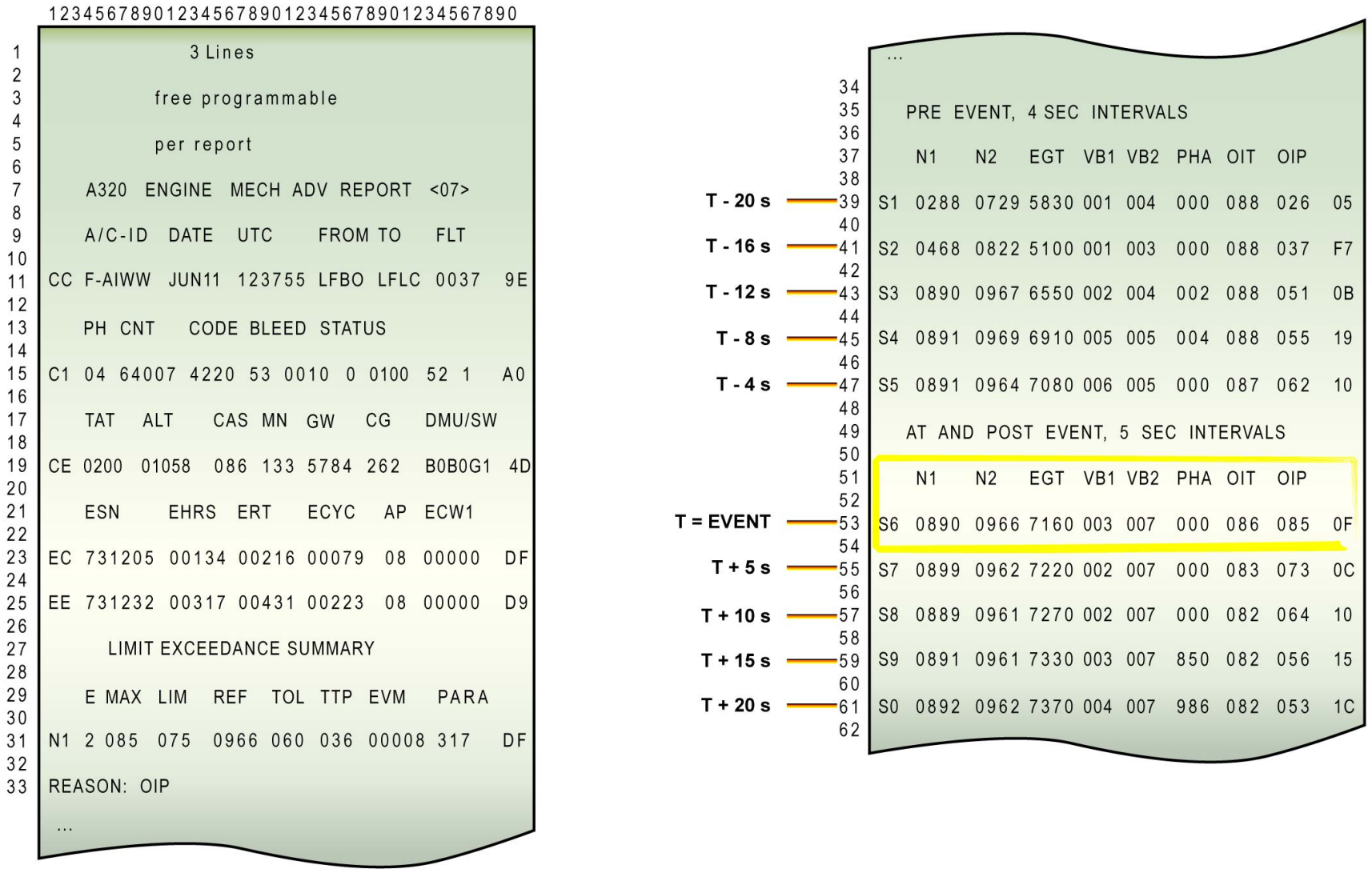
INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE MECHANICAL ADVISORY REPORT <07>

This report is generated when one of the following parameters is exceeded:
- oil temperature,
- oil pressure,
- vibration (N1 or N2).

5 parameter sets are recorded at 4 s intervals before the event and 4 parameter sets at 5 s intervals after the event. There is one report for each engine. Recording stops when exceeded parameters are back within operating conditions, or when the report as shown above is completed.

UGB13131 - U7ST0M0 - UM31DF000000002



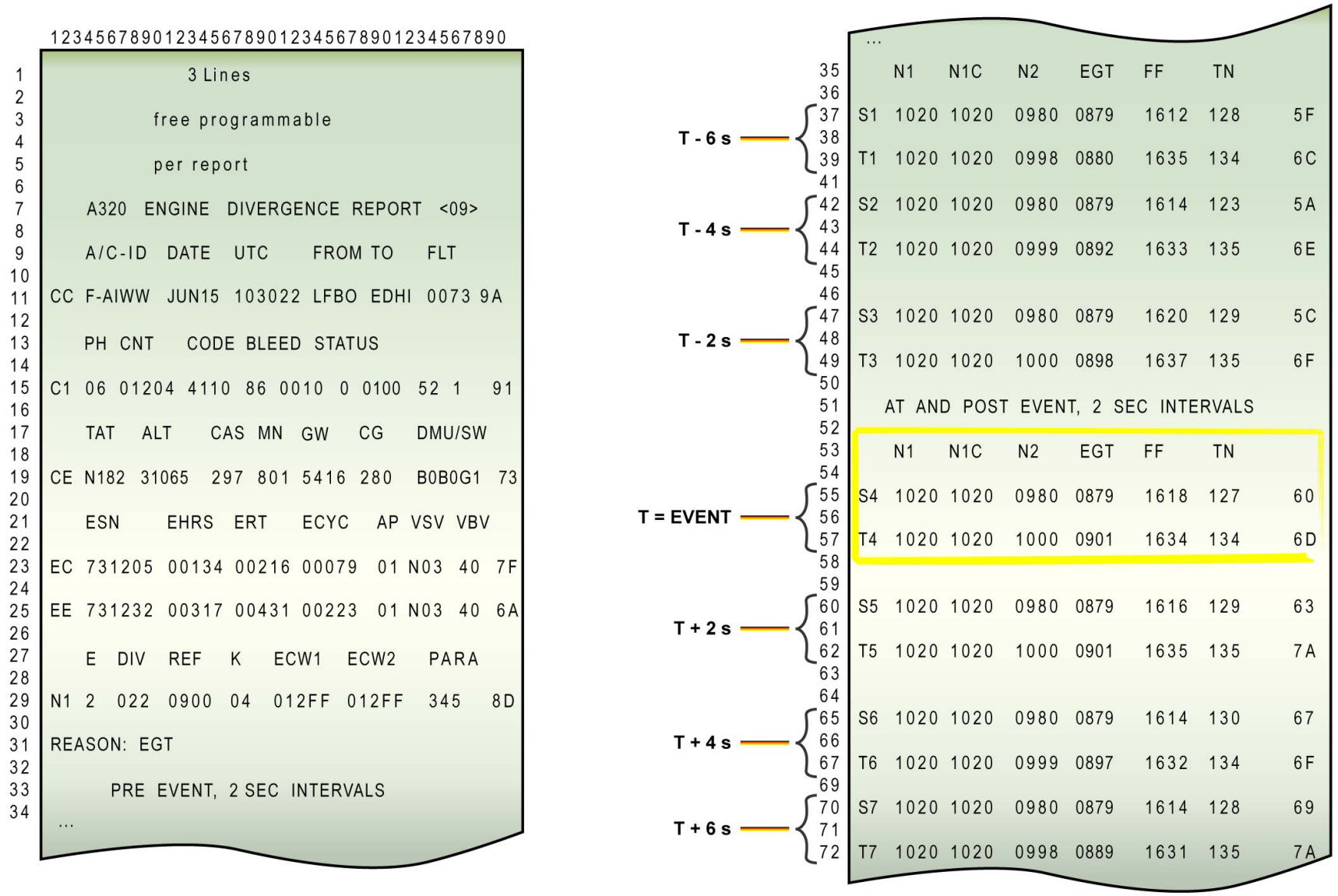
ENGINE MECHANICAL ADVISORY REPORT <07>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE DIVERGENCE REPORT <09>

This report is generated when, under similar operating conditions, the difference between engines 1 and 2 EGT or TN (Nacelle Temperature) is greater than threshold limits. 3 parameter sets are recorded at 2 s intervals before the event and 3 parameter sets at 2 s intervals after the event.

UGB13131 - U7ST0M0 - UM31DF000000002

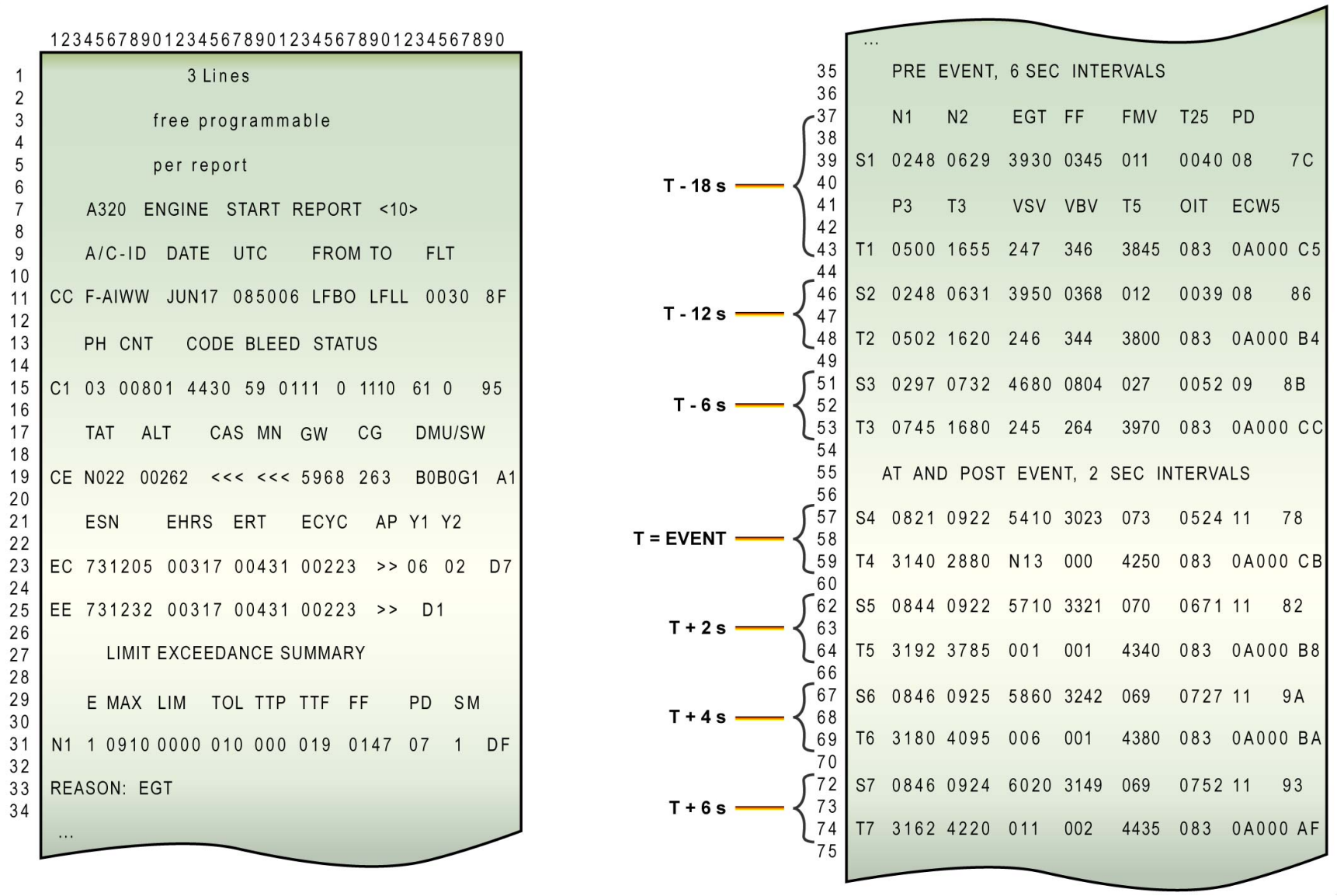


ENGINE DIVERGENCE REPORT <09>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE START REPORT <10>

This report is generated in case of engine start failure or after every F10.1 number of engine cycles (F10.1 is programmable), or every leg for X10 consecutive legs (X10 is programmable and X10max = 9). 3 parameter sets are recorded at 6 s intervals before the event and 3 parameter sets are recorded at 2 s intervals after the event. There is one report for each engine.



ENGINE START REPORT <10>

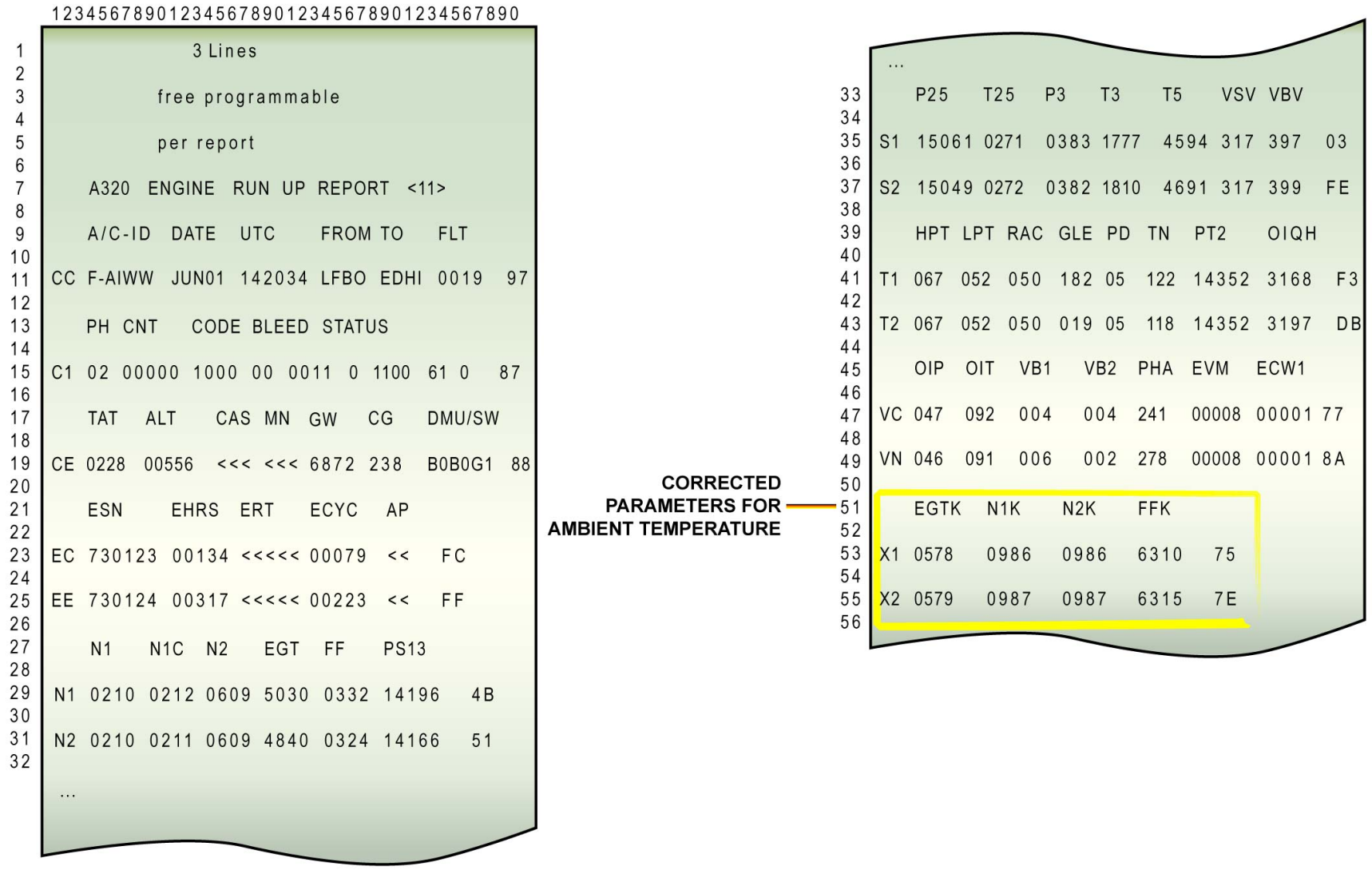
INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ENGINE RUN UP REPORT <11>

This report is basically a manually triggered report. It contains the same data as the engine cruise report plus corrected parameters for the ambient temperature. All data is an average over 20 seconds with the exception of:

- ESN,
- EHRS,
- ECYC,
- ERT (Engine Running Time).

UGB13131 - U7ST0M0 - UM31DF000000002



ENGINE RUN UP REPORT <11>

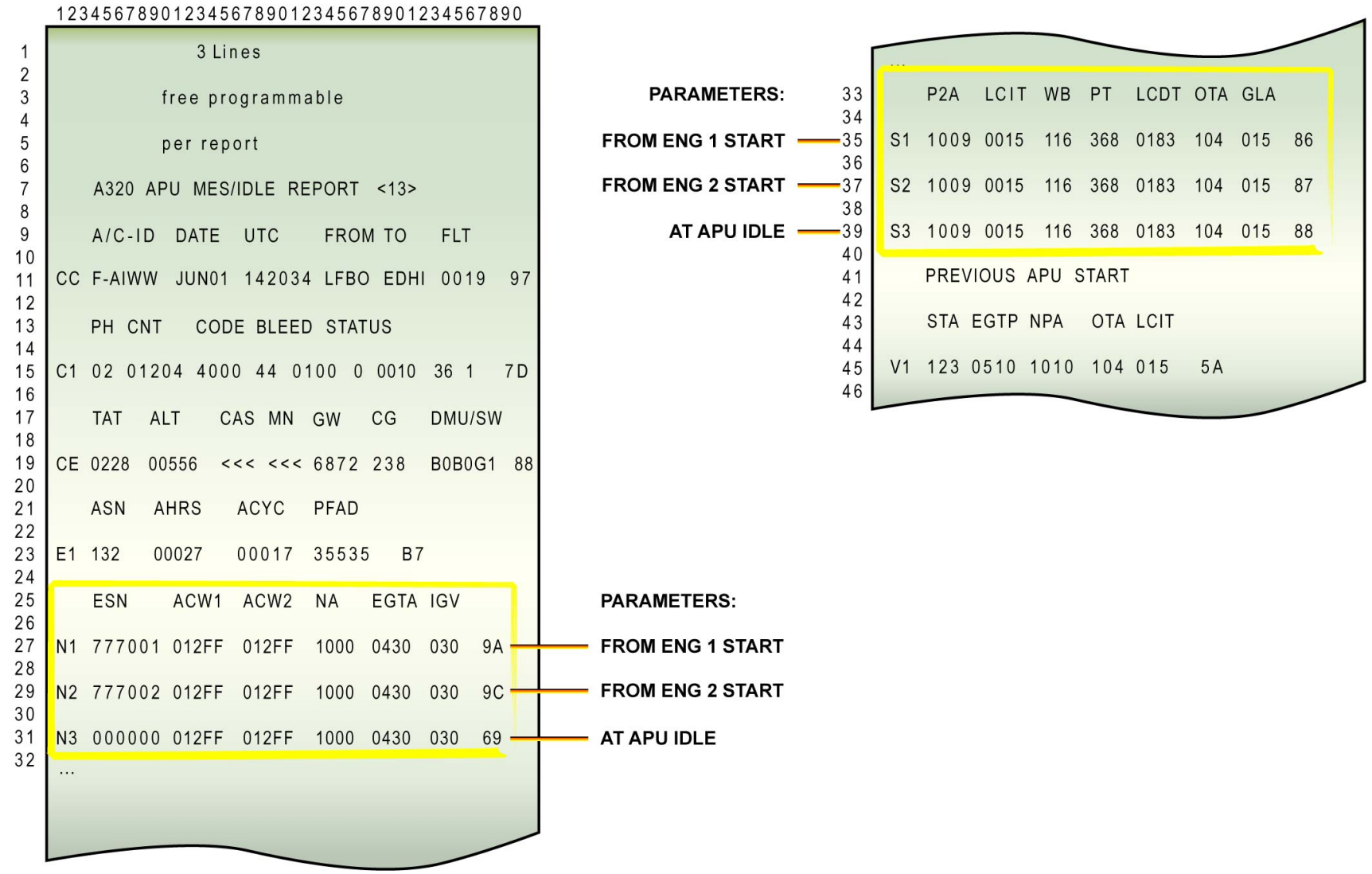
INDIVIDUAL PRINT REPORT DESCRIPTION (3)

APU MES/IDLE REPORT <13>

This report is generated when the engine is started with the APU. It presents APU parameters during and after engine start, and at APU idle. It also presents the last APU start parameters.

NOTE: MES means Main Engine Start.

UGB13131 - U7ST0M0 - UM31DF000000002


1234567890123456789012345678901234567890
3 Lines
free programmable
per report
A320 APU MES/IDLE REPORT <13>
A/C-ID DATE UTC FROM TO FLT
CC F-AIWW JUN01 142034 LFBO EDHI 0019 97
PH CNT CODE BLEED STATUS
C1 02 01204 4000 44 0100 0 0010 36 1 7D
TAT ALT CAS MN GW CG DMU/SW
CE 0228 00556 <<< <<< 6872 238 B0B0G1 88
ASN AHRS ACYC PFAD
E1 132 00027 00017 35535 B7
ESN ACW1 ACW2 NA EGTA IGV
N1 777001 012FF 012FF 1000 0430 030 9A
N2 777002 012FF 012FF 1000 0430 030 9C
N3 000000 012FF 012FF 1000 0430 030 69
...
PARAMETERS:
FROM ENG 1 START
FROM ENG 2 START
AT APU IDLE
PARAMETERS:
FROM ENG 1 START
FROM ENG 2 START
AT APU IDLE
...
P2A LCIT WB PT LCDT OTA GLA
S1 1009 0015 116 368 0183 104 015 86
S2 1009 0015 116 368 0183 104 015 87
S3 1009 0015 116 368 0183 104 015 88
PREVIOUS APU START
STA EGTP NPA OTA LCIT
V1 123 0510 1010 104 015 5A

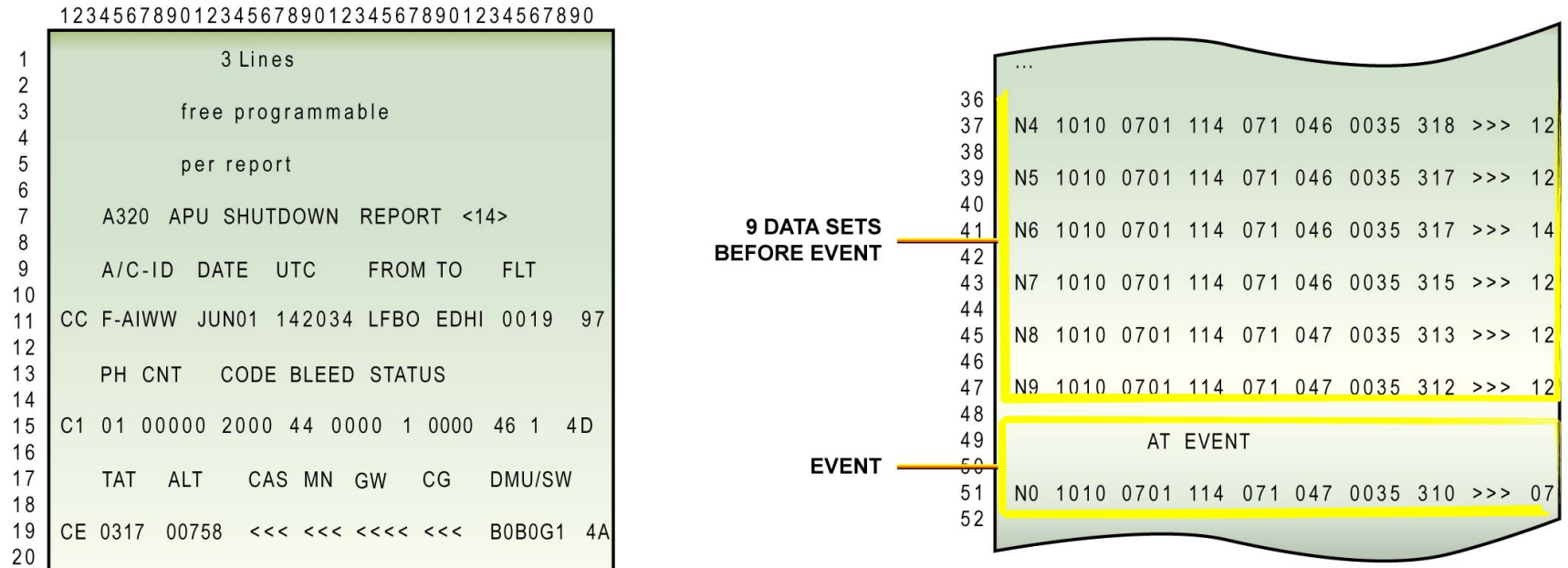
APU MES/IDLE REPORT <13>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

APU shutdown report <14>

This report is generated when there is an APU auto shutdown due to a detected failure. 9 data sets are recorded at 1 s intervals before the event.

UGB13131 - U7ST0M0 - UM31DF000000002



APU SHUTDOWN REPORT <14>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

LOAD REPORT <15>

This report is generated if excessive loads have been applied to the airframe during landing. An aircraft bounce can also be detected. It records aircraft aerodynamics parameter sets before, at and after a hard landing.

UGB13131 - U7ST0M0 - UM31DF000000002

```
   12345678901234567890123456789012345678901234567890
 1                3 Lines
 2
 3              free programmable
 4
 5              per report
 6
 7               A320  LOAD REPORT  <15>
 8
 9     A/C-ID  DATE   UTC     FROM TO    FLT
10
11  CC F-AIWW  SEP20  142034 LFBO LFPO 0018 9C
12
13     PH CNT    CODE BLEED STATUS
14
15  C1 07 49815 5300  62 0010  0 0100  81 0   9F
16
17     TAT   ALT    CAS MN  GW   CG    DMU/SW
18
19  CE 0185  03096   160 256 6156 286   B0B0G1 59
20
21     ESN     EHRS   ECYC   AP   FLAP   SLAT
22
23  EC 731172  01313  01376  >>   1000   1798   AC
24
25  EE 731173  01313  01376  >>   0997   1798   C7
26
27  LIMIT EXCEEDANCE AND SPOILER EXT SUMMARY
28
29     MAX  LIM   RALT  COUNTS
30
31  E1 N014 N010 3161  075 000 000 000 000   FF
32
33     REASON: VRTA
34  ...
```

```
   ...
35     VALUES AT 1 SEC BEFORE LAND/EVENT
36
37     RALT  RALR PTCH PTCR ROLL ROLR YAW
38
39  S1 3179  0496  0114  N013  0002  0002  0000 17
40
41     VRTA   LONG   LATG
42
43  T1 N013   0022    N000  89
44
```

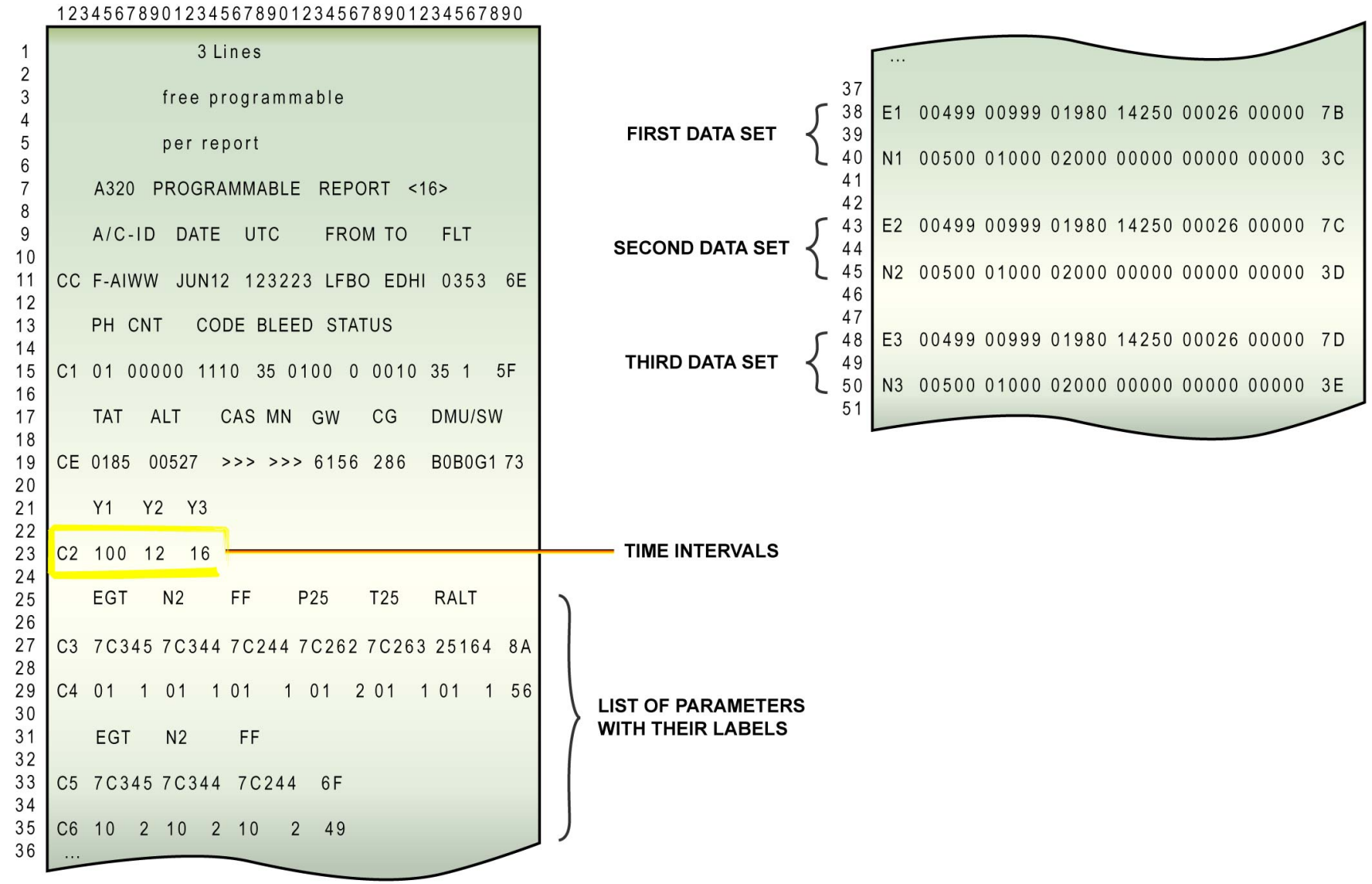
LOAD REPORT <15>

INDIVIDUAL PRINT REPORT DESCRIPTION (3)

FREE PROGRAMMABLE REPORTS <16,17 AND 18>

These reports are generated when specific conditions programmed by the airline are met. Each data set contains up to 12 parameters chosen by the airline. The report does not exceed 54 sets of data. The sampling intervals, the average intervals and the history time of parameter recording are chosen by the airline.

UGB13131 - U7ST0M0 - UM31DF000000002



FREE PROGRAMMABLE REPORTS <16,17 AND 18>

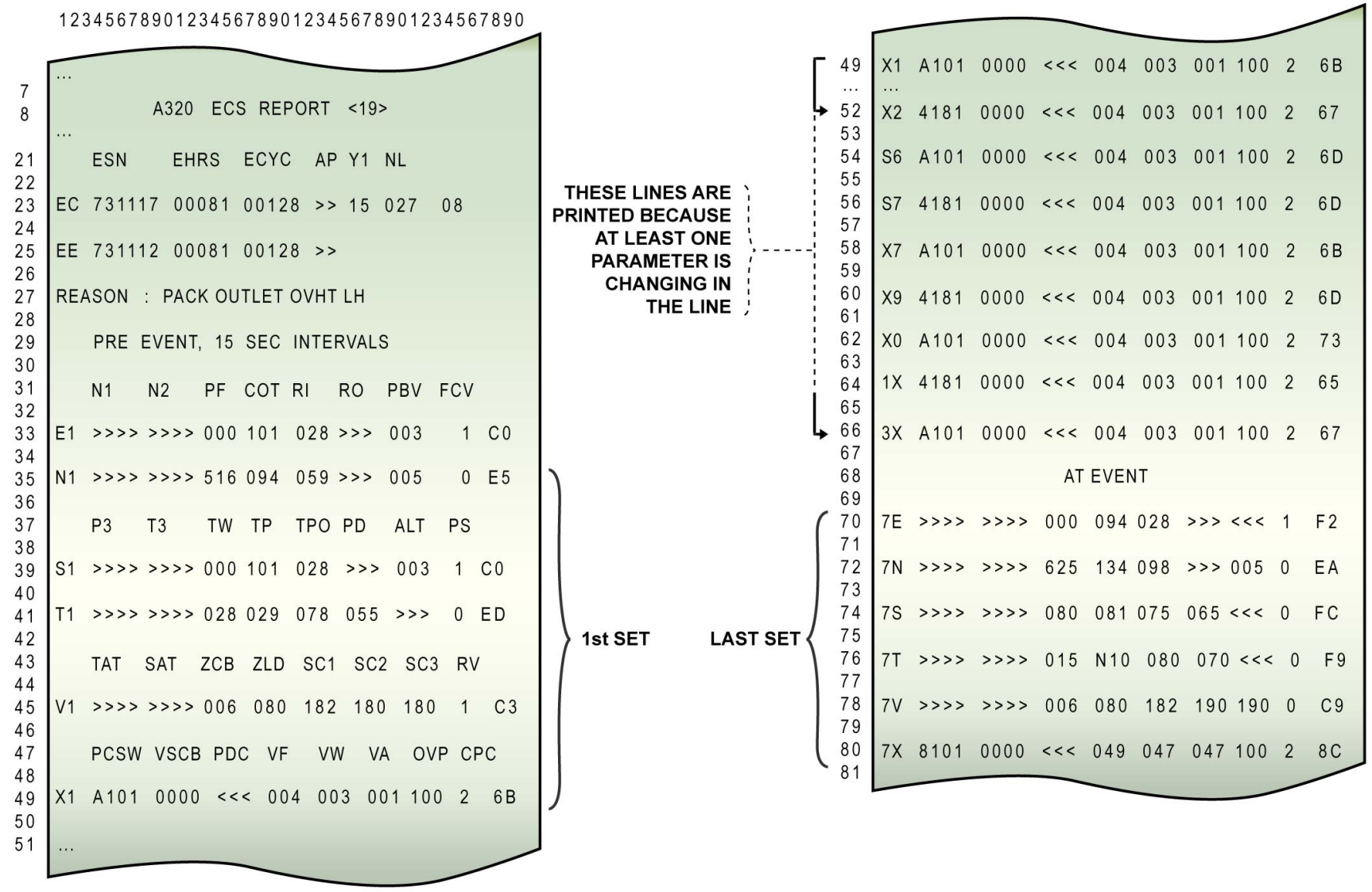
INDIVIDUAL PRINT REPORT DESCRIPTION (3)

ECS REPORT <19>

This report is generated when there is a malfunction in the air conditioning or pressurization system. It records engine, aircraft and environmental data at and 4 minutes before the event with 15 s intervals.

NOTE: ECS means Environmental Control System.

UGB13131 - U7ST0M0 - UM31DF000000002



ECS REPORT <19>

AIDS DESCRIPTION/OPERATION (3)

GENERAL INTERFACES

The Data Management Unit (DMU) part of the Flight Data Interface and Management Unit (FDIMU) sends data to MCDU 1 and 2 (the 3rd is optional), to the printer and to the Centralized Fault Display Interface Unit (CFDIU) through a single ARINC 429 data bus. Each one of these responds through a separate data bus.

NOTE: Only one MCDU can be used at a time for the Aircraft Integrated Data System (AIDS). The Aircraft Communication Addressing and Reporting System (ACARS) and the Multipurpose Disk Drive Unit (MDDU)(if installed) have individual input/output buses.

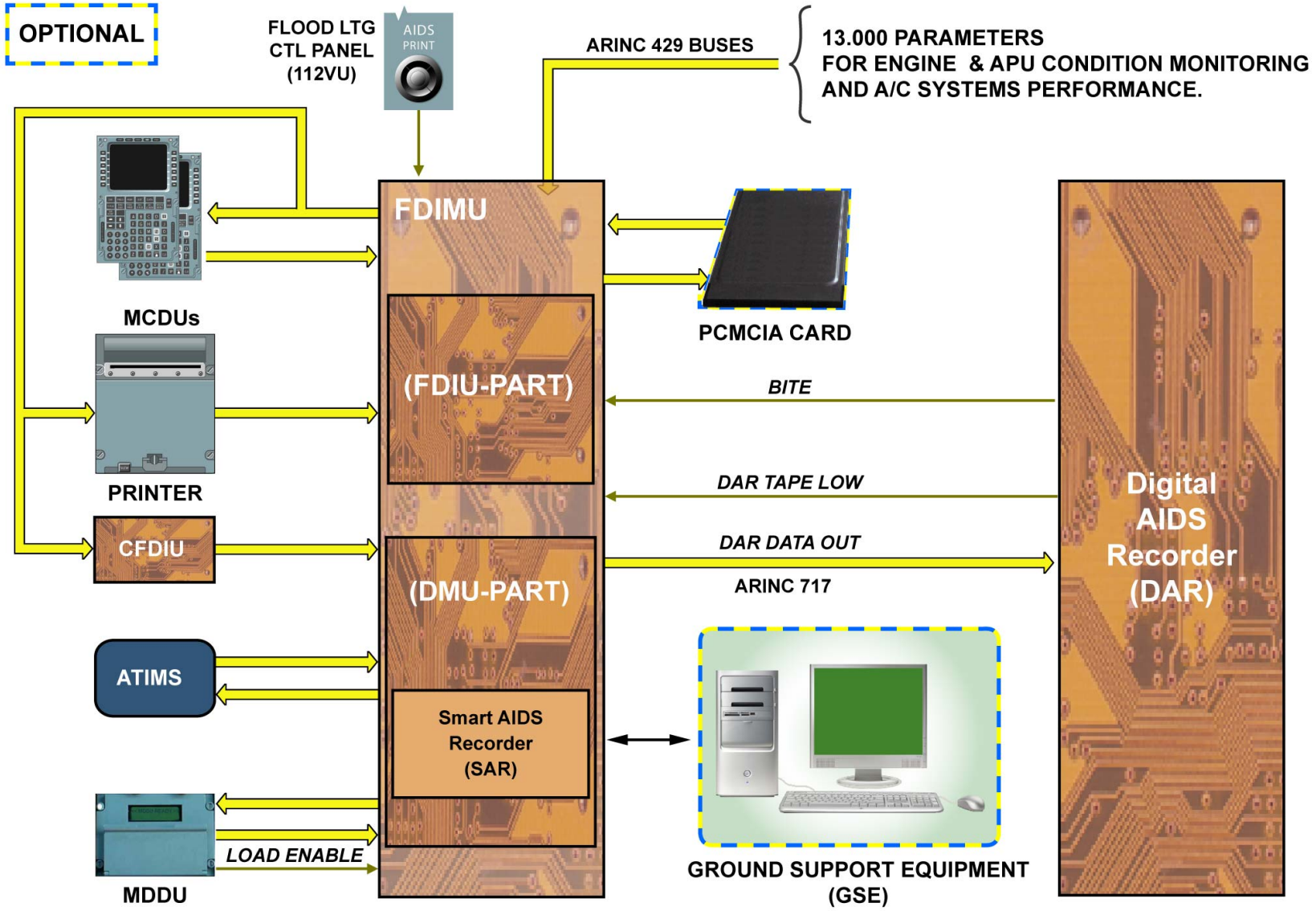
DAR INTERFACE

BITE and DAR TAPE LOW information is delivered from the Digital AIDS Recorder (DAR) to the FDIMU (DMU-part) through discrete signals. BITE and DAR TAPE LOW information causes a class 2 message on the Electronic Centralized Aircraft Monitoring (ECAM) maintenance status ("DAR") and two class 2 messages in the Centralized Fault Display System (CFDS) (DAR FAULT and DAR TAPE LOW).

FDIU INTERFACE

The Flight Data Interface Unit (FDIU) part of the FDIMU sends Digital Flight Data Recorder (DFDR) parameters to the DMU-part of the FDIMU through an ARINC 429 bus so that they can be recorded on the DAR.

UGB13131 - U7ST0M0 - UM31F3000000002



GENERAL INTERFACES ... FDIU INTERFACE

AIDS DESCRIPTION/OPERATION (3)

SYSTEM INTERFACE

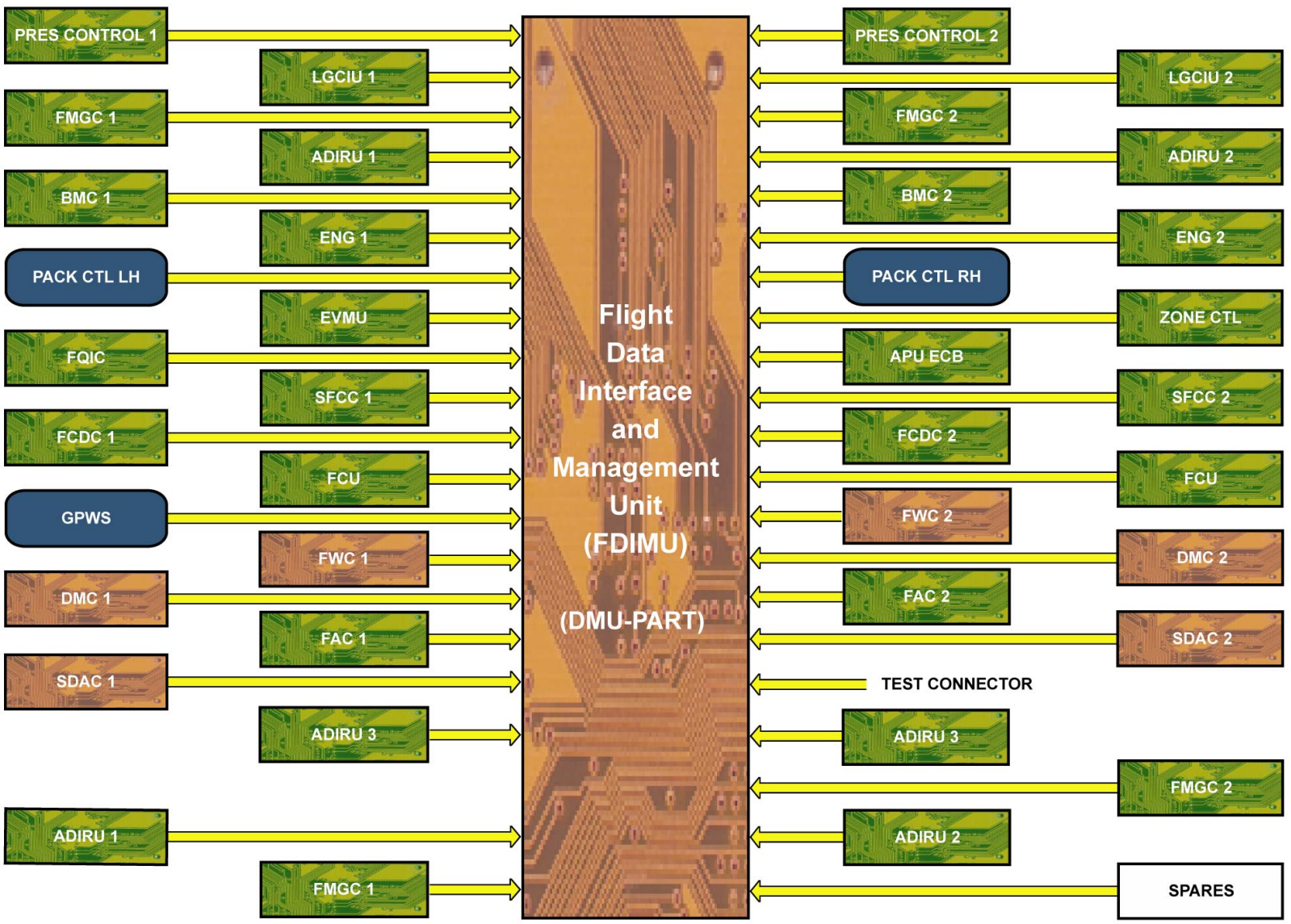
The FDIMU (DMU-part) receives approximately 13.000 parameters from various A/C systems through ARINC 429 data lines. These parameters can be recorded by the DAR.

NOTE: In addition, spares inputs are provided. Among these ARINC 429 inputs data lines, some of them are selectable for high or low speed from system computers.

PARAMETER CALL-UP

Parameters transmitted on the connected data buses can be shown on the MCDU in binary code with the label call-up function. At FDIMU delivery, 200 parameters are already defined with alpha call-up code and can be shown on the MCDU in engineering units. Approximately 1.500 parameters can be added to the initial alpha call-up list by programming.

UGB13131 - U7ST0M0 - UM31F3000000002



SYSTEM INTERFACE & PARAMETER CALL-UP

AIRBUS S.A.S.
31707 BLAGNAC cedex, FRANCE
STM
REFERENCE UGB13131
APRIL 2013
PRINTED IN FRANCE
AIRBUS S.A.S. 2013
ALL RIGHTS RESERVED

AN EADS COMPANY